The 1911-12 Announcement of the New York State College of Agriculture will appear on August 1, 1911.

OFFICIAL PUBLICATIONS OF CORNELL UNIVERSITY

VOLUME III NUMBER 4

NEW YORK STATE COLLEGE OF AGRICULTURE

ANNOUNCEMENT 1910-11

FEBRUARY 15, 1911
PUBLISHED BY CORNELL UNIVERSITY
ITHACA, NEW YORK

CALENDAR OF CORNELL UNIVERSITY AND OF THE COLLEGE OF AGRICULTURE

1910-1911

First Term

Sept. 19, Monday, University entrance examinations begin.
Sept. 27, Tuesday, ACADEMIC YEAR BEGINS. MATRICULATION of new students. University Scholarship examinations begin.
Sept. 28, Wednesday, MATRICULATION of new students.
Special students, old or new, must first present themselves at the Office of the Secretary, Main 122.
Sept. 29, Thursday, REGISTRATION of matriculated students.
Sept. 30, Friday, INSTRUCTION BEGINS in all the departments of the University at Ithaca. President's annual address to the students, 12:00 M.
Nov. Thursday and Friday, THANKSGIVING RECESS.
Nov. 29, Tuesday, REGISTRATION for the Winter-courses, beginning at 8:00 A. M. at the Office of the Secretary.
Nov. 30, Wednesday, 8 A. M., Instruction begins in Winter-courses.
Dec. 22, Thursday, Christmas recess for regular and special students begins.
Jan. 4, Wednesday, instruction resumed.
Jan. 11, Wednesday, FOUNDER'S DAY.
Feb. 8, Wednesday, First term closes.

Second Term

Feb. 11, Saturday, REGISTRATION for second term.
Feb. 22, (week of), Farmers' Week.
Feb. 24, Friday, Close of Winter-Courses.
April 5, Wednesday, Instruction ends.
April 11, Tuesday, Instruction resumed.
April 15, Saturday, Latest date for receiving applications for Fellowships and Graduate Scholarships.
May 27, Saturday, University holiday.
June 18, Sunday, Baccalaureate sermon.
June 20, Tuesday, Class Day.
June 21, Wednesday, Alumni Day and Annual Meeting of the Trustees.
June 22, Thursday, FORTY-THIRD ANNUAL COMMENCEMENT.

Summer Session, 1911

July 6, Thursday, Summer Session begins.
Aug. 16, Wednesday, Summer Session ends.

1911-1912

First Term

Sept. 15, Friday, University entrance examination begins.
Sept. 25, Monday, ACADEMIC YEAR BEGINS. MATRICULATION of new students.
Sept. 26, Tuesday, MATRICULATION of new students.
Sept. 27, Wednesday, REGISTRATION of Matriculated students.
Sept. 28, Thursday, INSTRUCTION BEGINS in all departments of the University at Ithaca.

NEW YORK STATE COLLEGE OF AGRICULTURE

FACULTY

JACOB GOULD SCHURMAN, A.M., D.Sc., L.L.D., President of the University.

LIBERTY HYDE BAILEY, M.S., L.L.D., Director of the College of Agriculture, and Dean of the Faculty.

ISAAC PHILLIPS ROBERTS, M.Agr., Professor of Agriculture, Emeritus.

JOHN HENRY COMSTOCK, B.S., Professor of Entomology and Invertebrate Zoology.

HENRY HIRAM WING, M.S., in Agr., Professor of Animal Husbandry.

JOHN CRAIG, M.S., in Agr., Professor of Horticulture.

THOMAS LYTTLETON LYON, Ph.D., Professor of Soil Technology.

HERBERT JOHN WEBBER, M.A., Ph.D., Professor of Plant-Breeding.

JOHN LEMUEL STONE, B.Agr., Professor of Farm Practice.

JAMES EDWARD RICE, B.S.A., Professor of Poultry Husbandry.

BENJAMIN MINGE DUGGAR, M.S., Ph.D., Professor of Plant Physiology.

GEORGE WALTER CAVANAUGH, B.S., Professor of Chemistry in its Relations with Agriculture.

GEORGE NIEMAN LAUMAN, B.S.A., Professor of Rural Economy.

HERBERT HICE WHETZEL, A.B., M.A., Professor of Plant Pathology.

ELMER OTTERBEIN FIPPIN, B.S.A., Professor of Soil Technology.

GEORGE FREDERICK WARREN, Ph.D., Professor of Farm Management and Farm Crops.

WILLIAM ALONZO STOCKING, Jr., M.S.A., Professor of Dairy Industry.

CHARLES SCOON WILSON, A.B., M.S.A., Professor of Pomology.

CHARLES HENRY TUCK, A.B., Professor of Extension Teaching.

ALBERT RUSSELL MANN, B.S.A., Secretary to the College of Agriculture, Registrar, and Professor of Agricultural Editing.

WILFORD MURRAY WILSON, M.D., Professor of Meteorology (detailed by Weather Bureau, United States Department of Agriculture).

WALTER MULFORD, B. S. A., F. E., Professor of Forestry.

ALEXANDER DYER MacGILLIVRAY, Ph.D., Assistant Professor of Entomology and Invertebrate Zoology.

WILLIAM ALBERT RILEY, Ph.D., Assistant Professor of Entomology.

JAMES GEORGE NEEDHAM, Ph.D., Assistant Professor of Limnology and General Biology.

MERRITT WESLEY HARPER, M.S., Assistant Professor of Animal Husbandry.

BRYANT FLEMING, B.S.A., Assistant Professor of Rural Art.

WILLIAM CHARLES BAKER, B.S.A., Assistant Professor of Drawing.
———— ————, Assistant Professor of Dairy Industry.
JAMES ADRIAN BIZZELL, Ph.D., Assistant Professor of Soil Technology.
CLARENCE ARTHUR ROGERS, M.S.A., Assistant Professor of Poultry Husbandry.
PAUL J. WHITE, A.B., M.S.A., Ph.D., Assistant Professor of Farm Crops.
GLENN WASHINGTON HERRICK, B.S.A., Assistant Professor of Economic Entomology.
HOWARD WAIT RILEY, M.E., Assistant Professor of Farm Mechanics.
CYRUS RICHARD CROSBY, A.B., Assistant Professor of Entomological Investigations.
HAROLD ELLIS ROSS, B.S.A., M.S.A., Assistant Professor of Dairy Industry.
DONALD REDDICK, A.B., Ph.D., Assistant Professor of Plant Pathology.
HARRY HOUSER LOVE, Ph.D., Assistant Professor of Plant-Breeding Investigations.
ARTHUR WITTER GILBERT, Ph.D., Assistant Professor of Plant-Breeding.
ELMER SETH SAVAGE, B.S.A., M.S.A., Assistant Professor of Animal Husbandry.
LOWELL BYRNS JUDSON, A.B., B.S., Investigator in Floriculture.
CHARLES CLEVELAND HEDGES, A.B., Instructor in Agricultural Chemistry.
LEWIS KNUDSON, B.S.A., Instructor in Plant Physiology.
EDWARD RUSSEL MINNS, B.S.A., Instructor in Farm Practice and Assistant Superintendent of the University Farms.
GEORGE WALTER TAILBY, Jr., B.S.A., Superintendent of Live-Stock.
LEWIS JOSEPHUS CROSS, B.A., Instructor in Agricultural Chemistry.
———— ————, Instructor in Rural Art.
EDWARD SEWALL GUTHRIE, M.S. in Agr., Instructor and Investigator in Dairy Industry.
KENNETH CARTER LIVERMORE, B.S.A., Instructor and Investigator in Farm Management.
PAUL WORK, A.B., B.S., Instructor and Investigator in Olericulture.
MARTIN EDWARD EVANS, B.S., Instructor in Farm Mechanics.
RALPH HICKS WHEELER, Instructor in Extension Teaching.
ROY DAVID ANTHONY, B.S., in Agr., Instructor in Pomology.
LEE BRIGGS COOK, B.S.A., Instructor in Dairy Industry.

Other Officers of Instruction and Administration

ALICE GERTRUDE McCLOSKEY, A.B., Lecturer in Nature-Study.
MARTHA VAN RENSSELAER, A.B., Lecturer in Home Economics.
ANNA BOTSFORD COMSTOCK, B.S., Lecturer in Nature-Study.
FLORA ROSE, B.S., M.A., Lecturer in Home Economics.
MRS. HELEN BINKERD YOUNG, B. Arch., Instructor in Home Economics.
JOHN WALTON SPENCER, Agent in Extension Work.

HUGH CHARLES TROY, B.S.A., Assistant in Dairy Laboratory.
WALTER WAGER HALL, Assistant in Cheese Making.
WEBSTER EVERETT GRIFFITH, Assistant in Butter Making.
HARVEY LYON AYRES, Superintendent of Dairy Manufactures.
CHARLES HERBRET VAN AUKEN, Assistant in Animal Husbandry.
ADA ELJIVA GEORGIA, Assistant in Nature-Study.
CLARA NIXON, Assistant in Poultry Husbandry.
MORRIS MICKEY McCOOL, M.S. in Agr., Assistant in Plant Physiology.
MORTIER FRANKLIN BARRUS, A.B., Assistant in Plant Pathology.
LOIS WATSON WING, A.B., Assistant in Dairy Industry.
HAROLD JOEL CONN, B.S., Assistant in Soil Technology.
EMMONS WILLIAM LELAND, B.S.A., Assistant in Soil Technology.
ROBERT MATHESON, M.S., in Agr., Assistant in Entomology.
JOHN THOMAS LLOYD, A.B., Assistant in Biology.
ANNA CLEGG STRYKE, A.B., Assistant in Entomology.
WALTER STANLEY LYON, Assistant in Poultry Husbandry.
FRANCIS THERON FINCH, Assistant in Poultry Husbandry.
FRANKLIN STEWART HARRIS, B.S., Assistant in Soil Technology.
RALPH JOHN GILMORE, A.M., Assistant in Biology.
GEORGE RICHARD HILL, Jr., B.S., Assistant in Plant Physiology.
ANNA ELIZA JENKINS, Assistant in Plant Pathology.
ALVIN CASEY BEAL, M.S. in Agr., Assistant in Floriculture.
SARA MAY BAILEY, A.B., Assistant in Home Economics.
ANNA DICK, Assistant in Home Economics.
FRANCES ADDISON WHEELER, Assistant in Nature-Study.
LOUIS MERWIN HURD, Assistant in Poultry Husbandry.
ROBERT PALMER TRASK, Assistant in Poultry Husbandry.
WALTER WARNER FISK, B.S., in Agr., Assistant in Dairy Industry.
OLIVER WESLEY DYNES, Assistant in Farm Crops.
HARRY O. BUCKMAN, Assistant in Soil Technology.
JOHN HARRY PHILLIPS, Assistant in Soil Technology.
RICHARD ALAN MORDOFF, Assistant Registrar.
LUCY HARRIET ASHTON, Assistant to the Secretary.
GEORGE WALTER TAILBY, Foreman of the Farms.
CHARLES EDWARD HUNN, Gardener.
GEORGE M. COSH, Gardener to the Horticultural Department.
WALTER GARNET KRUM, Superintendent of Poultry Plant.
ANDREW JACKSON LAMOUREUX, Librarian.
HERBERT W. TEETER, Superintendent of Plant-Breeding Garden.
EDWIN S. DeLANY, Clerk.
LAURA McLALLEN VAN AUKEN, Clerk in Department of Dairy Industry.
GILBERT ARTHUR RENNEY, Superintendent of Mailing-Rooms.

THE COLLEGE OF AGRICULTURE

By act of the Legislature of the State of New York, approved May 9, 1904, an appropriation of $250,000 was made for buildings for the College of Agriculture; and the act authorized Cornell University to purchase the dairy building erected by the State some years ago, and to add the purchasing price ($40,000) to the appropriation, thereby making a building fund of $290,000. The act also established the College as "The New York State College of Agriculture at Cornell University." These buildings were first occupied in June, 1907. They consist of a group of three connected by covered loggias, and a detached building occupied by the Department of Animal Husbandry. The main group of buildings, with a frontage to the south of 484 feet, occupies a site to the east of the original University campus, with commanding views in all directions. All the buildings are built of brick of various sizes and colors. The Main Building, central in the group of three, contains in the basement mailing and storage rooms for the publications of the College, a large lavatory with baths, lockers, an extension office, Cornell Countryman office, and laboratories and store-rooms for horticultural and other work. The heating plant for the building is beneath this basement. A completely inclosed passageway leads to the basement of the Dairy building on the east and to the Agronomy building on the west.

The first floor of the Main building contains the offices of administration, including the offices of the Director and the Secretary, and the business office, to the west of the main entrance. To the east are the office for extension teaching, the library and two seminar rooms, and the office of the Department of Rural Economy. Between these two groups of rooms is the auditorium, seating about six hundred on the main floor and the two balconies. The loggias on this floor are open at the sides, but covered above.

The second floor is occupied by the Department of Horticulture, with its lecture rooms and two laboratories, and offices for the staff. Here is also provided a women's rest room and lavatory.

The Department of Entomology and General Invertebrate Zoology occupies the third floor, with its museum at the head of the stairway and the offices of the staff immediately beyond. The provisions for light in the laboratories are worthy of note. The lecture-room will accommodate one hundred and sixty. Quarters are provided for the work in limnology.

In the center of the fourth floor is a suite of rooms occupied by the Central Station, New York Section, of the Weather Bureau of the United States Department of Agriculture. To the west are Nature-Study and Home Economics offices, and to the east the laboratories of the Home Economics Department and a suite of dark rooms.

The Dairy building to the east of the Main building and connected with it by passageways on three floors, is in two sections. The three-story part contains in the basement, locker-rooms and lavatory with bath, rooms for instruction and practice in dairy mechanics, and a steam laundry. The main floor contains the general offices of the Department and the large laboratories for dairy bacteriology with the necessary incubator-room. A

special reading-room, which also serves in part as a museum, is provided. On the second floor is the large lecture-room seating 250, with its preparation-room, and a smaller lecture-room. The large milk-testing laboratory is also provided with a preparation-room. The attic houses the drawing required in the various courses of the College. Connected with this building is the section containing the manufacturing rooms. The milk-receiving room is at the far end and connects with the separator-room and the cheese-making room as well as with a can-cleaning room. Between the separator-room and the churn-room is the cream-ripening room and the refrigerator for butter. Beyond the cheese-making room is a series of three curing-rooms, the starter-room and a room for dairy-farm practice. Adjoining the main Dairy building are the rooms for market-milk handling, including a receiving-room, bottling-room, sterilizing and refrigerating rooms, and a bottle wash-room; and below these in the basement are large storage and refrigerator rooms. On the same side as the rooms for cheese-making and in the basement, are the rooms for making fancy cheese, with additional curing-rooms and a room for casein-making. A boiler- and engine-room with the necessary storage, complete the general features of the Dairy building.

To the west of the Main building and connected with it, as is the Dairy building, by passageways on three floors, is the Agronomy building. The basement is devoted to instruction in Farm Mechanics and in Soil Technology. The first floor contains a number of offices and the laboratory for Plant Physiology, while the feature of the second floor is the large laboratory for the study of Farm Crops. The Experiment Station also has a large laboratory for the study of the problems of fertility. The top floor houses the work in Plant Pathology and Plant-Breeding.

Detached from the main group of buildings to the northeast is the building for the Department of Animal Husbandry, with its large judging pavilion, offices, library, lecture and laboratory rooms.

To the west of the Agronomy building is a rural school house of modern design, and a school-garden. Here an elementary school is maintained.

In the rear of the Main building is the University barn and the Poultry Department. The new barns provided by act of the Legislature are on the farms to the eastward.

The new glass-houses are located just east of the agricultural group.

The farms and experimental plats, comprising about 638 acres, are adjacent.

The Agricultural Experiment Station is a department of the New York State College of Agriculture. Incidentally, students may acquire instruction from observing and discussing the experiments that are being conducted.

The publications of the Agricultural Experiment Station include to date twenty-three annual reports and two hundred and ninety bulletins. These publications are distributed free to such residents of the State as apply for them, so far as the means of the Station will permit and as they are available.

EQUIPMENT OF THE DEPARTMENTS

Agricultural Chemistry

The instruction in Agricultural Chemistry is given in Morse Hall, the Department of Chemistry. Here ample facilities are provided for laboratory work, which is made an important part of the instruction. The laboratories are well lighted and provided with gas, electric light, distilled water, and compressed air. Each student is provided with a complete set of apparatus for quantitative analysis. The work is arranged to familiarize the student with the composition and properties of the more important agricultural chemicals.

For the advanced courses there is a special laboratory accommodating twenty-four students.

The lecture-rooms are provided with electric projection lanterns that allow the use of lantern slides for illustrating the lectures, and they have large well-equipped lecture tables. There are also a chemical museum and reading-room, and the general facilities of a well-equipped chemical department.

Animal Husbandry

The equipment in this Department available for purposes of instruction is as follows:

1. The College herds and flocks. A herd of about 75 head of cattle is maintained, which will shortly be increased to more than 100. Aside from about a car-load of steers fed for market each year, it is essentially a dairy herd and to a large extent has been bred and developed by the College itself. It at present contains representative specimens of Holsteins, Jerseys, Guernseys, and Shorthorns.

A flock of about 50 sheep includes representative specimens of Dorsets, Shropshires, Hampshires, Southdowns, Delaines, Rambouillets, and Cheviots, and is kept mainly for the production of winter or hothouse lambs. About 10 brood sows of the Cheshire breed—"The New York Farmer's Hog"—are kept to utilize waste dairy products and to illustrate a profitable early maturing butchers' hog of a semi-bacon type.

2. Herd- and flock-books. The library of herd- and flock-books is large and complete, comprising more than 1,000 volumes and including complete sets of all the more important breeds and many of the lesser ones.

A fairly complete collection of lantern slides, illustrating breed type, and skeletons of the horse and the ox add to the material available for class-room purposes.

The Animal Husbandry building, detached from the main group, but adjacent, is 60 x 90 feet in size.

Dairy Industry

The Department of Dairy Industry occupies the building east of the Main agricultural building. A covered loggia connects the two buildings. The class rooms, bacteriology and testing laboratories, locker-rooms (with shower bath), reading-room, offices and dairy mechanics rooms occupy a part of the building which is 50 x 100 feet in size, and three stories high.

All manufacturing work is conducted in the remaining part of the building, which is 60 x 160 feet in size, and one story high, with basement under part of it. The manufacturing part of the building is planned and equipped to make it thoroughly sanitary and well adapted for instruction and for commercial work. In the winter about 7500 pounds of milk are handled daily, and in the summer the milk received at the Dairy Building and the cream received from three skimming-stations represents about 25,000 pounds of milk daily. The skimming-stations are located at short distances north of Ithaca and are equipped and conducted as are stations operated exclusively for commercial purposes.

Instruction is given by lectures and recitations in class rooms, and supplemented by practice in laboratories and manufacturing rooms. The practice is of seven kinds:

1. Testing milk and milk products for their richness and purity. The testing laboratory is equipped with 200 lockers for students, the leading styles of turbine and hand centrifugal Babcock testers, one Russian Babcock tester, one Gerber tester, casein testers, moisture and acid testing apparatus, also lactometers and all necessary glassware.

2. Dairy bacteriology. This division is provided with two large and well-lighted laboratories, individual desks and lockers for students, a full line of equipment for making media, hot air and steam sterilizers, incubators for maintaining constant temperatures, high-speed centrifuge for determining dirt and bacterial content of milk, high-power microscopes, and all glassware and apparatus necessary for bacteriological work.

3. Butter-making. This work is conducted in several different rooms. The farm dairy room contains leading styles of hand-power separators and churns, and various kinds of apparatus used in a dairy where butter is made in small quantities. Creamery methods are taught chiefly in a large separator-room, provided with several types of power separators, milk heaters and pasteurizers, and in a chruning-room which contains several different kinds of power churns and workers. There are special rooms for making starters, ripening cream, and holding butter in cold storage. There is also a boiler room with 30 horse-power boiler, engine and necessary pumps.

4. Cheddar cheese-making. The room for this work is equipped with one large vat and eight smaller ones, one horizontal continuous pressure press, one upright press, hoops for making cheese in three sizes, also rennet tests, acid tests, curd mills, and other small apparatus. Four insulated curing-rooms adjoin the manufacturing room.

The milk-receiving room and can-washing room are located convenient to the creamery and cheese-rooms. These are provided with scales, composite sample outfit, and a power can-washer and rinser.

5. Fancy cheese-making. Making-rooms and curing-rooms and necessary equipment are provided for the manufacture of a few varieties of so-called fancy cheese. The varieties to be made will be increased in number as rapidly as possible.

6. Market-milk handling. For this work there are three rooms besides a special refrigerator and receiving-room. In their arrangement, the principles governing the proper management of any commercial sanitary milk

plant have been considered. The equipment includes a rotary washer, rinser, steam-chest sterilizer, cooler and approved bottle-filling apparatus. The college operates a market milk route for the disposal of milk produced by the college herd, and all records are kept in the same manner as might obtain with any commercial concern.

7. Dairy mechanics. This instruction is given in the Department of Farm Mechanics in the basement of the Agronomy building. The equipment includes steam engines, gasoline engines, shafting, various sizes of pulleys, belts, different types of separators, and tools for pipe-fitting and soldering and plain carpenter work,—a list of tools similar to and somewhat larger than would be found in many well-conducted dairy manufacturing plants.

A deposit is required to cover the value of apparatus loaned to students. When the apparatus is returned in good order, the deposit is returned less a charge of 25 cents, to apply on losses of general equipment. Clean, white over-all suits are required for all practice work in this department. These suits may be purchased by the student, or rented from the Department at fifty cents per term. Lockers for these suits, as well as for equipment used by individual students in the laboratories, are provided without charge.

Entomology

The entomological laboratories are well equipped for work in any phase of the subject. There is a good supply of microscopes and accessories, including equipment for photo-micrographic work. In addition there is a very full outfit for work in insect photography. Ample facilities in the line of microtomes, paraffin ovens, and reagents are provided for work in insect morphology and embryology, and an extensive collection of prepared slides is at the disposal of students working in these subjects.

The insect collections have been developed as an adjunct to the work of instruction and are especially rich in biological and illustrative material. In addition to many exotic species, they contain specimens of a large part of the more common species of the United States. These have been determined by specialists and are accessible for comparison.

The lecture-room equipment consists of a synoptic collection of insects, sets of the Leuckart and the Pfurtscheller diagrams, models, projection lanterns, and a complete outfit for the projection of microscopic objects.

Adjacent to the laboratories is an insectary which, together with the insectary of the Agricultural Experiment Station, affords exceptional opportunities to advanced students for special investigation in the study of life histories, and for experiments in applied entomology.

For studies of the life histories, biology, and economic importance of aquatic forms, unrivalled facilities are afforded by the field laboratory, located in the midst of the Renwick marshes and fully provided with breeding cages, running water, and aquaria, in addition to the natural facilities.

Farm Management and Farm Crops

Instruction in Farm Crops is given by means of lectures, recitations and field and indoor laboratory work. The Department is provided with a

lecture-room and large, well-lighted laboratory. The latter is equipped with specially designed desks for 92 students, with gas and water and ample locker space. Farm crop materials are procured for use in indoor laboratory work. Bulletins of the various experiment stations constitute a part of the laboratory equipment. The farms and experimental plots are used for laboratory work in the field.

Farms adjacent to Ithaca furnish laboratory materials for the study of farm management. Ithaca is specially favorably situated for the study of farm management, because there is a great diversity of farm conditions. Some of the best and some of the poorest farms of the State are within easy reach of Ithaca. Excursions are also made to a few farms in other parts of the State for the study of field crops and farm management.

Farm Mechanics

This Department is housed in the north end of the basement of the Agronomy building. The equipment includes a traction engine piped to the steam mains for convenience in laboratory study, seven gasoline engines, several pumps, hydraulic rams, a windmill, threshing machine complete with all modern improvements, plows, harrows, cultivators, planters, harvesters, and a large number of other agricultural implements which because of their bulk are stored in the barns of the college. Among a number of implements and models of historic value, special note should be made of the copies of the Rau plow models obtained by ex-President A. D. White in Germany in 1868. A number of pieces of special apparatus have been designed and constructed as required, of which the most important is a "Sprayograph" for testing spray nozzles.

For the work in farm engineering, the equipment consists of two very good surveyor's transits, eight farm levels, measuring tapes, leveling rods, ranging poles, axes, etc.

Home Economics

In recognition of a growing need for scientific instruction in the subjects most closely related to the welfare of the home and the family, a Department of Home Economics was established in the College of Agriculture in the fall of 1907. The quarters of this department are on the fourth floor of the Main building of the College and consist of (1) a laboratory equipped to accommodate twenty students. This equipment is modern and includes a collection of the recent appliances which are useful in simplifying household processes, such as fireless cookers, bread and cake mixers, alcohol appliances of various kinds. (2) A small dining room and a kitchen planned to illustrate the lessened effort made possible in a condensed area where there is a convenient arrangement of all apparatus. (3) A small household laundry with both hand and power equipment. (4) A class-room. (5) Departmental offices. The department has a good library, a collection of slides, and various illustrative material needed in lectures.

Horticulture

The equipment is divided into two parts,—that which is associated with the class-rooms and laboratories on the second and basement floors of the

Main agricultural building, and that connected with the forcing-houses and grounds surrounding them and farther afield.

1. Class-rooms and laboratories. Lectures and a major part of the laboratory work are given in the headquarters of the Department, which occupy the entire second floor of the Main building of the agricultural group. On this first floor are commodious lecture-rooms, laboratories and offices.

The larger lecture-room is provided with a stereopticon, and has a seating capacity of 120; the smaller seats 35, besides accommodating the department garden herbarium. One laboratory is devoted to practical and systematic pomology, floriculture and olericulture, and is equipped in the most approved manner for the teaching of the practical and laboratory phases of horticultural work. It accommodates 40 students. The other laboratory is devoted to the use of advanced students, where those who are working in the graduate department or engaged in research courses are provided with suitable appliances for their special needs. Space is afforded in this for 20 students. The remainder of the floor is devoted to museum purposes and offices for the instructing staff. Large display cases lining the corridor are filled with horticultural specimens, tools and appliances.

In the basement is a laboratory for practical work in nursery problems and elementary pomology. The capacity of this laboratory is 50 students, so that a beginning class of 100 may be accommodated in two sections.

2. Forcing-houses and orchards. New glass structures for the study of forcing-crops, such as flowers, vegetables, and fruits, covering an area of about 7,000 square feet, are nearing completion and will be used in connection with nearly all classes, though more especially associated with floriculture and olericulture. One house is assigned to advanced students for the working out of problems on which they are engaged, and another is given over to the study of the variation of plants and the technique of plant-breeding.

The collection of spray machinery, including gas engines, traction machines, and the like, is quite complete, permitting thorough instruction in the methods of controlling orchard enemies.

The land equipment comprises the vegetable gardens near the campus, and fifty acres of land on the University farm now partly planted and in process of development. These are furnishing excellent demonstration material for lecture and laboratory.

Aside form ordinary equipment, the garden herbarium, with more than 12,000 sheets, is an important aid in the study of systematic pomology and plant variation There is also an exceptionally fine collection of nearly 10,000 negatives illustrating all phases of fruit, flower, and vegetable growing. This collection is being added to continually, and furnishes a useful source for lantern slides to illustrate up-to-date methods in the management of fruit plantations, the construction of forcing-houses, and the growing of vegetables and flowers in field and under glass. The department has a collection of 2,000 lantern slides, to which additions are constantly being made.

Plant Pathology

The Department of Plant Pathology, organized in 1907, is housed in the south end of the top floor of the Agronomy building. The equipment con-

sists of a large elementary laboratory, an advanced laboratory, work-room, culture-room, and offices, including small research rooms for graduate and advanced students. The equipment of the Department, which is new throughout, includes furniture especially built for the particular work of the Department, an up-to-date and complete equipment of microscopes, microtomes, sterilizers, electric incubators, etc., for teaching and investigation. There are also a rapidly growing plant pathology herbarium, photographs, a department library, etc. It is expected also that land and greenhouse facilities will very shortly be available for demonstration and experimental work as well as for teaching purposes. The Department is now in a position to offer facilities for practically every line of work included within its field.

Plant Physiology

The instructional work and the equipment in Plant Physiology are designed, aside from the principles of scientific training, to meet fundamental and practical needs of

1. Students who go into general agriculture or farm work.
2. Students whose subsequent work in the various lines of plant industry, teaching, or investigation may be so specialized as to require some detailed scientific training, particularly in such phases of the work as plant nutrition, the relation of plants to climatological factors, the course of bacterial and other fermentation, cell physiology and heredity.

Instruction in Plant Physiology is not confined to laboratory studies and class demonstrations, but ample opportunities will be afforded, upon the completion of the new greenhouses, for class work and for individual investigation. Moreover, the University farms and grounds will supply, for those who can devote the summer to their investigations, a variety of crops and ornamental plants needed for particular observation and experiments.

Poultry Husbandry

The Department of Poultry Husbandry is located north of and near the new Agricultural College buildings. The area occupied is about four acres. About one mile distant is the poultry farm proper, a tract of about fifty acres. The buildings consist of a main building 30 x 46 feet, and houses providing seventy pens for the accommodation of about fifteen hundred fowls. These houses include twenty-one New York State gasoline-heated colony brooder-houses and summer houses for rearing twenty-five hundred or more chickens annually, and a new laying house 276 feet long containing twenty-three pens. The main building contains an incubator cellar 30 x 30 feet, an egg-room, killing-room, carpenter shop, lockers for fifty students, and a dormitory, laboratory and museum.

The lecture and recitation courses, laboratory, seminar, systematic reading and drawing courses are all given in the Dairy building. In this building also are located the department office and reading-room.

Instruction is divided about equally between lectures, recitations, text-book study and required reading, and the practice courses:

1. Lectures. For the lecture course there are a large number of charts and models, about 658 lantern slides and 1,775 negatives with blue prints, relating to poultry.

2. Systematic reading. Students have easy access to the Agricultural College and Experiment Sation library and reading-room. In addition to this there are the poultry alcove in the University Library and the poultry reading-room (in the Dairy building), where the principal poultry books and fifty-four poultry papers are on file. There is also a large card subject index of poultry literature.

3. Laboratory, shop, plant and field practice. These four types of practice work are given in the afternoons to supplement the lectures and recitations. For the shop work there is a good collection of carpenter's tools.

For the laboratory and field practice, several sets of caponizing instruments of different makes, anatomical and drawing instruments, model of a turkey and of an egg during incubation, a collection of eggs of nearly all the varieties of poultry, microscopes, camera, balances and scales, models of poultry buildings and trap nests, twenty-five enlargements of various varieties of poultry from the American Standard of Perfection, killing instruments, a collection of packages for marketing poultry products, and samples of forty kinds of poultry feeds are available.

4. Feeding and management practice. For this course twenty-eight pens, containing 15 to 30 fowls each of ten leading varieties of fowls and four varieties of ducks, are used. There is a fattening house, 12 x 30 feet, fitted with suitable appliances. Record sheets are supplied by which the student shows at the end of the course a complete history of the method of feeding and care, value of production, profit and loss, etc. Fattening crates and three styles of cramming machines are provided; also five makes of bone cutters, including a large power cutter, six horse-power gasoline engine, power feed mill, clover cutter and root slicer.

5. Incubator practice. For the course in incubator practice there are 30 incubators, including several of each of the leading machines and one or more of a large number of makes sent here for student inspection and use. The incubator cellar is provided with electric lights for reading the thermometers and testing the eggs. Record sheets are supplied which show the method of operation of the machine each day. There are hygrometers and thermographs for moisture and temperature readings.

6. Brooder practice. A pipe-system brooder-house, 45 feet long by 12 feet wide, five types of brooders, including the gasoline-heated colony brooders and a gasoline storage tank, are used.

Soil Technology

The courses in Soil Technology are designed to give the student in general agriculture an understanding of the fundamental principles of the management of soils for crop production, and to afford opportunity for special study in particularly important fields of the subject. The former group includes a study of the processes of soil formation and classification, the physical and chemical properties and the modification of the soil by cultural operations. It is a summary of the general field of soil knowledge. In the latter group,

particular phases of the subject are taken up for advanced study, as detailed in the courses of instruction.

The lectures are illustrated by lantern slides and demonstrations, and the laboratory is equipped to accommodate 128 students. This equipment includes the most modern apparatus for the study of the physical constitution of the soil, its capacity for retention and movement of water, for the circulation of air, relation to heat, amount and effects of organic matter, and other important physical and chemical properties. Each student has the use of desks and lockers, containing a stock equipment, and of balances, microscopes, thermometers, mechanical analysis outfits, aspirators, and so on.

Large quantities of a number of type samples of soil are provided for study, and in addition there is a large collection of samples of important type soils from all parts of the United States for examination and comparison. The study of the soils of the United States is supplemented by detailed soil maps of all areas surveyed to date.

The great variety of soils and soil conditions in the vicinity of Ithaca is made use of for field excursions to study their classification, occurrence and treatment. All necessary equipment for the preparation of farm soil maps is provided. A large collection of soil-working implements is available for study with reference to their lines of construction for efficiency of operation in soils of different character and condition.

For special advanced study and investigation along the lines that have been mentioned, special apparatus and facilities are available, according to the subject.

EXPENSES, FELLOWSHIPS, SCHOLARSHIPS, AND PRIZES

Tuition is free to regular and special students in the College of Agriculture. (See paragraph in Italics below.)

Fees are as follows:

Matriculation	$ 5 00

Degrees

Baccalaureate	$10 00
Advanced	20 00

Incidentals

Post-graduate fee, each term	$ 7 50
Regular students, 3d and 4th years, each term	7 50
Specials, each term	7 50
Infirmary fee, each term	2 00

Other deposit fees are required in various laboratory courses, about which students should inquire before registering, and attention is called to the expenses of excursions required in various courses.

Tuition will be charged to all graduate and undergraduate students in the College of Agriculture, entering after the year 1910–11, who have not been residents of the State of New York for at least one year immediately preceding their admission to the College of Agriculture. The tuition for undergraduates

will be $100 for regular students and $125 for special students; the $100 tuition is payable in instalments of $55 at the beginning of the first term and $45 at the beginning of the second term; the $125 tuition is payable similarly in instalments of $70 and $55. Graduate students in the university will be charged the tuition of the college in which the major subject is taken, and in the case of graduate students taking no major subject, the tuition will be that of the college in which two-thirds of the work is done. After the year 1910-11, the $7.50 fee now charged each term to graduate, special, and regular third and fourth year students will be omitted.

A limited number of free scholarships have been established in the College of Agriculture for students from outside the State of New York.

The expense of text-books, instruments, etc., varies from $10 to $75 per annum.

The cost of living in Ithaca, including board, room, heat and lights, varies from $5.50 to $10 per week.

The cost of board, rent of furnished room, fuel and lights, in Sage College or Sage Cottage, which are exclusively for women, varies from $225 to $300 per year. Both buildings are warmed by steam, lighted by electricity, and, in most cases, the sleeping apartment is separated from the study. The responsibility for the conduct of the students living in Sage College and the Cottage rests with the Adviser of Women in the University. Inquiry regarding board and rooms at the Sage College and the Cottage should be addressed to the Business Manager of Sage College, Ithaca, N. Y.

Scholarships and Fellowships in Agriculture
For Regular and Special Students

The Roberts scholarship fund, a gift of the late Dr. Charles H. Roberts of Oakes, Ulster County, N. Y., October 17th, 1906, provides five scholarships each tenable for one year. As expressed by the founder, the purpose of these scholarships is to furnish financial assistance to students in the College of Agriculture who are of good moral character, who show native ability, tact and application, and who are in need of such assistance, and especially those who come from rural districts. The award is made after the end of the first term of each year. Application blanks and copies of the regulations may be had at the office of the Secretary to the College of Agriculture. All applications must be on the official blanks which, with all other information, must be filed before February 1, 1911. The value of each scholarship is $240.

A few free scholarships are open to non-residents of New York State.

A fellowship worth $500 is awarded to the College of Agriculture and the Veterinary College combined.

A number of industrial fellowships are established for a limited period, usually two years, by growers, companies, etc., who wish to cooperate with the College of Agriculture in the solution of agricultural problems. These fellowships are given to men who from their training and experience are deemed competent to undertake the work.

For Winter-Course Students

At its annual meeting, held February, 1910, the New York State Grange adopted a resolution whereby $600 is to be given to members of the Order in the form of twelve scholarships in the winter-courses in agriculture in Cornell University. The scholarships are each of a value of $50, to be awarded to men or women who attain the highest standing in competitive examination. The candidate should apply to the Master of the Pomona Grange in his home county, or to the Deputy in counties that have no Pomona.

Mr. H. L. Beatty has offered for the year 1910–1911, a similar scholarship of a value of $75, "open to any farmer who resides in Bainbridge, N. Y., or to any boy over 16, who shall have attended the Bainbridge High School for one full term."

The Eastman Prize for Public Speaking

With the object of developing qualities of personal leadership in rural affairs, Mr. A. R. Eastman of Waterville, N. Y., has established an annual prize of one hundred dollars for public speaking on country life subjects in the College of Agriculture. This prize is designated as the Eastman Prize for Public Speaking. Competition is open to any regular or special student.

GENERAL INFORMATION AS TO COURSES

The regular instruction in the College of Agriculture is comprised in a four-year course leading to the degree of Bachelor of Science in Agriculture. Aside from this there are winter-courses, not leading to credits in the University, and opportunities for students to pursue special work. A circular describing the winter-courses may be had on application.

Students may pursue agricultural subjects in the Graduate School of the University, leading to the degrees M.S. in Agr. and Ph.D.

The Regular Four-Year Course

The regular course in the College of Agriculture is four years, and leads to the degree of Bachelor of Science in Agriculture. There is a combined course with the State Veterinary College comprising six years and leading to two baccalaureate degrees (page 21).

Candidates for admission to the regular or four-year course must be at least sixteen years of age, or, if women, seventeen. They must have certificates of good moral character, and students from other colleges or universities are required to furnish from those institutions certificates of honorable dismissal. Students are admitted on examination, or on presenting credentials of the Education Department of the State of New York, or on acceptable school certificates.

Those contemplating entering the College, who have not lived on farms or received considerable practical experience in agriculture, are urged to spend at least one year on a well-managed farm to familiarize themselves with common farm affairs and operations before entering the College.

Candidates for admission must file their credentials and obtain permits for examination at the University Registrar's office, *Morrill 10*. The results of examination may be ascertained from the Registrar.

Entrance Requirements of Four-Year Course.

The subjects that may be offered for admission are named in the following list, and the figure in parenthesis following each subject indicates its value expressed in units and shows the maximum and minimum amount of credit allowed in the subject. A unit represents five recitations a week for one year in a study.

1a. English A	(2)	8a. Ancient History	(½–1)
1b. English B	(1)	8b. Modern History	(½–1)
2a. First Year Greek	(1)	8c. Am. History, Civics	(½–1)
2b. Second Year Greek	(1)	8d. English History	(½–1)
2c. Third Year Greek	(1)	9a. Elementary Algebra	(1)
3a. First Year Latin	(1)	9b. Intermed. Algebra	(½)
3b. Second Year Latin	(1)	9c. Advanced Algebra	(½)
3c. Third Year Latin	(1)	9d. Plane Geometry	(1)
3d. Fourth Year Latin	(1)	9e. Solid Geometry	(½)
4a. First Year German	(1)	9f. Plane Trigonometry	(½)
4b. Second Year German	(1)	9g. Spher. Trigonometry	(½)
4c. Third Year German	(1)	10. Physics	(1)
5a. First Year French	(1)	11. Chemistry	(1)
5b. Second Year French	(1)	12. Physical Geography	(1)
5c. Third Year French	(1)	13. Biology*	(1)
6a. First Year Spanish	(1)	14. Botany*	(½–1)
6b. Second Year Spanish	(1)	15. Zoology*	(½–1)
6c. Third Year Spanish	(1)	16. Agriculture†	(½–1)
7a. First Year Italian	(1)	17. Drawing	(½–1)
7b. Second Year Italian	(1)	18. Manual Training	(1)
7c. Third Year Italian	(1)		

*If an applicant has counted Biology (1) he may not also offer Botany (½) or Zoology (½).
†For entrance credit in agriculture, the work outlined in the Syllabus for Secondary Schools—Agriculture, published by the New York State Education Department 1910, or that outlined as A Secondary Course in Agronomy, Circular 77 (revised), 1908, Office of Experiment Stations, United States Department of Agriculture, or the equivalent of either must be presented. The presentation of a satisfactory note-book will be considered in giving credit.

For admission to the New York State College of Agriculture, an applicant must offer either A or B as below:

A. Fifteen units arranged as follows: English (3), History (1), Elementary Algebra A (1), Plane Geometry (1), French (3) or German (3), elective (6).

B. The Arts College Entrance Diploma or the Science College Entrance Diploma issued by the Education Department of the State of New York.

Other Details of Admission

For other details as to subjects and methods of admission, see the General Circular of Information, which may be had on application to the Registrar, Cornell University, Ithaca, N. Y.

For admission to the freshman class and to advanced standing from other colleges and universities, all communications should be addressed to the Registrar. See the General Circular of Information.

For admission as a special student, communications should be addressed to the Secretary, College of Agriculture, and attention is called to the paragraphs on pages 21 and 22 of the General Circular of Information.

For admission to graduate work and candidacy for advanced degrees, communications should be addressed to the Dean of the Graduate School.

Requirements for the Degree of Bachelor of Science in Agriculture

The requirements for the degree of Bachelor of Science in Agriculture shall be residence for eight terms, and, in addition to the prescribed work in the departments of Physical Culture and of Military Science and Tactics, the completion of one hundred and twenty hours of required and elective work as outlined on pages 20 and 21.

Credit towards a degree for work done in a preparatory school upon subjects which may be offered for entrance to the University will be given to those students only who, in addition to satisfying all entrance requirements, pass separate examinations in the subjects for which they seek college credit. These examinations will cover substantially the same ground as the University courses in the subjects. An applicant desiring a college credit examination of this kind must apply to the Registrar as early as possible, and in no case later than September 11, 1911, specifying which fifteen units he intends to offer in satisfaction of the entrance requirements, and upon what other entrance subjects he wishes to be examined for credit.

In case he fails to satisfy the entrance requirements in any one or more of the units upon which he has proposed to enter, but passes the credit examination in any other subject or subjects, he may use the latter towards satisfying entrance requirements, but in that case he cannot also receive college credit for it. The college credit examinations will be held in September, on the dates set for the entrance examinations in the same subjects.

A student who receives at entrance twelve or more hours of entrance credit in addition to the requirements for admission, may be regarded as having satisfied one term of residence. Under no circumstances shall surplus entrance credit be accepted as the equivalent of more than one term.

A student who has satisfied the entrance requirements of this College, and has afterwards completed in two or more Summer Sessions in Cornell University at least twelve hours of work in courses approved by the departments concerned, may be regarded as having thus satisfied one term of residence. Under no circumstances shall work done in Summer Sessions be accepted as the equivalent of more than one term of residence or be counted for more than twelve hours towards graduation.

A student admitted to the College of Agriculture from another College in Cornell University or from any other institution of collegiate rank, will be regarded as having completed the number of terms and hours to which his records entitle him, and will receive all the privileges of students who have completed the same number of terms and hours by residence in the College. In order, however, to secure the degree of Bachelor of Science in Agriculture, he must have completed the prescribed subjects in the four-year course, and two-thirds of his elective work must have been taken in courses allowed as

agricultural electives. He must also have been in residence in the College of Agriculture at least two consecutive terms and have completed not less than fifteen hours a term of which two-thirds, at least, must be subjects taught by the staff of the College of Agriculture.

A student must register for at least 12 hours each term and no new student may register for more than 18 hours. Maximum registration by old students is determined on the basis of record.

All men students who do not specialize to the extent of fifteen hours in Entomology, Plant-Breeding, Plant Physiology, Rural Art, or Home Economics, must pass, before graduation, the examination of the Farm Practice Department.

At least two-thirds of the entire elective work of each year must be chosen from the agricultural subjects described on the following pages.

The Course Leading to the Degree of Bachelor of Science in Agriculture

Freshman year	No. of course	Hours 1st term	Hours 2d term
English	1	4	4
Botany	1	3	1
Botany	2	–	2
Chemistry	1	6	–
Chemistry	85 or 6	–	4 or 5
Biology	1	3	3
Electives	..	0–2	1–4
Total		16–18	15–18

Sophomore year	No. of course	Hours 1st term	Hours 2d term
Geology*	1	3	3
Chemistry†	85, 85*a*	–	6
Physics	1	4	–
Physics	5	2	–
Physics	10	–	2
Physiology, one of the following:			
Physiology of domestic animals	21	–	3
Human physiology	3	3	–
Plant physiology	7 or 8	4	–
Electives	.....	2–9	1–13
Total		15–18	15–18

In addition to the above, the required work in military drill and physical training must be taken.

*Optional for students taking a major in Home Economics.

†Required for students taking Chemistry 6 in the freshman year. The laboratory work, 85a, may be taken during the first term, leaving the four-hour lecture course for the second term. Students who do not take Chemistry 6 may not take 85a.

Political Science 51 may be taken during this year.

Junior year	No. of course	Hours 1st term	Hours 2d term
Political Science	51	3	3

The remainder of the work is made up of electives, at least two-thirds of which must be taken in the College of Agriculture subject to the following restrictions:

In selecting the subjects in the major group, the student must obtain the advice and approval of some one Professor or Assistant Professor having charge of a subject within the group, who shall be chosen by the student. This shall be done at the beginning of the sophomore year.

All students except those registered in Rural Art shall have passed before graduation at least fifteen hours of agricultural electives in one of the groups named below, and at least three hours in each of the others:

Group A.—Farm Crops
Farm Management
Horticulture
Home Economics
Farm Mechanics

Group B.—Animal Husbandry
Poultry Husbandry
Dairy Industry

Group C.—Agricultural Chemistry
Soil Technology
Plant Physiology
Plant-Breeding

Group D.—Plant Pathology
Entomology
Limnology
Rural Economy

Combined Course in Agriculture and Veterinary Medicine

A regular student who has satisfactorily completed all the required work of his course and who has a credit of at least ninety hours may, with the permission of the faculties concerned, be registered both in the College of Agriculture and in the New York State Veterinary College and, on the completion of thirty hours, of which not less than twelve hours shall be taught in the New York State College of Agriculture, may be recommended for his degree. On the completion of the remaining two years and meeting the requirements of the State Veterinary College, he will then receive the degree of D. V. M.

DEPARTMENTS OF INSTRUCTION

With Outlines of Courses That May Be Chosen by Regular or Special Students as Agricultural Electives.

Subject to the restrictions already mentioned (pages 19, 21), at least two-thirds of the elective work must be chosen from the courses described on the following pages.

Elective Courses Open to Freshmen

Chemistry, 6 (see schedule of freshman year); Entomology, 2, 4, 5, 22, 23; Dairy Industry, 1, 2, 6; Drawing, 1, 2; Farm Mechanics, 3, 4, 20; Farm Practice, 3; Horticulture, 32; Meteorology, 1; Rural Economy, 1; Rural Art, 1, 2; Nature-Study, 1, 4.

Unless otherwise noted, all courses are given in the buildings of the College of Agriculture. Agricultural Chemistry is given in Morse Hall. Courses inclosed in brackets will not be given in 1910-1911.

Agricultural Chemistry

85. **Agricultural Chemistry.** Second term. Four hours. Lectures (3) T Th S, 11. *Chemistry Lecture Room 1.* Recitations (1) M, 8, 9; W, 8, 9; F, 8, 9. Professor CAVANAUGH and Messrs. HEDGES, CROSS and RICE.

Prerequisite. Chemistry 1.

A general course treating of the relations of chemistry to agriculture and dealing with the composition and chemical properties of plants, soils, fertilizers, feed-stuffs, insecticides and fungicides.

85a. **Agricultural Chemistry.** Laboratory course. Either term. Two hours. Practice (2) T Th, 2–4:30, or W F, 8–10:30. *Morse Hall.* Professor CAVANAUGH and Messrs. HEDGES and RICE.

Prerequisites. Chemistry 1 and 6. Required of those who have had 1 and 6 and are taking 85.

[86. **Agricultural Chemistry.** Advanced course. First term. Two hours. Lectures (2) T Th, 9. *Chemistry Lecture Room 4.* Not given in 1910-11. Professor CAVANAUGH.]

Prerequisites. Open to those who are taking or have completed Chemistry 87 or 88.

87. **Agricultural Analysis.** First term. Three hours. Lectures, none. Practice (3) T Th, 2–5, S, 9–12. *Morse Hall.* Professor CAVANAUGH and Mr. CROSS.

Prerequisites. Chemistry 1, 6, and 85a.

Fertilizers, soils and insecticides.

88. **Agricultural Analysis.** Second term. Three hours. Lectures, none. Practice (3) T Th, 2–5, S, 9–12. *Morse Hall.* Professor CAVANAUGH and Mr. CROSS.

Prerequisites. Chemistry 87, and 89 or its equivalent.

Foods, feeding-stuffs and dairy products.

89. **Dairy Chemistry.** First term. Two hours. Lectures (2) T Th, 9. *Chemistry Lecture Room 4.* Professor CAVANAUGH.

Prerequisites. Open to those who are taking or have completed Chemistry 87 or 88.

90. **Advanced Agricultural Analysis.** Credit and hours by arrangement and appointment. Professor CAVANAUGH.

This course is designed to meet the needs of those doing research work in Agricultural Chemistry.

91. **Elementary Agricultural Chemistry.** First term. Three hours. Lectures (3) M W F, 8. *Chemistry Lecture Room 2.* Professor CAVANAUGH and Messrs. CROSS and HEDGES.

Open only to special students.

Animal Husbandry

1. **Animal Husbandry.** Throughout the year. Four hours. Lectures (3) M W F, 9. Practice (1) M T W Th or F, 2–3:30, by appointment. *Animal Husbandry Building.* Professor WING, Assistant Professors HARPER and SAVAGE.

Prerequisites. None.

The principles of breeding, including the history, development, creation, and improvement of the various races and breeds of farm animals; the principles of feeding, care, selection, and management of dairy and beef cattle, sheep, and swine.

2. **Meat and Milk Production.** Second term. Three hours. Lectures (2) T Th, 11. *Animal Husbandry Building.* Practice, library work as assigned. Professor WING and Assistant Professor HARPER.

Prerequisite. First term of Animal Husbandry 1.

A study of practical methods of milk, beef, mutton, and pork production, especially as based on the results of experiment.

3. **Practice in Feeding and Stable Management.** Second term. Three hours. Lectures, none. Practice daily, 7:30–9 A. M. *Barns and Stables.* Professor WING and Mr. G. W. TAILBY, JR.

Prerequisite. Animal Husbandry 1. The ability to milk well is required.

5. **The Horse.** First term. Four hours. Lectures (3) M W F, 11. Practice (1) T, 10–12. *Animal Husbandry Building.* Assistant Professor HARPER.

Prerequisite. First term of Animal Husbandry 1.

History, characteristics of breeds, selection, judging, feeding, care, training, and development of the horse.

6. **Mechanics of the Horse.** Second term. Three hours. Lectures and recitations (2) W F, 11. Practice (1) M, 10–12. *Animal Husbandry Building.* Assistant Professor HARPER.

Prerequisite. Animal Husbandry 5.

Lectures on animal mechanics, animal proportions, and the relation of the latter to specific uses. Practice in measuring animals and testing the value of given measurements for given purposes.

10. **Advanced Stock Judging.** Throughout the year. One hour. Lectures, none. Practice (1) S, 10:30–12:30. *Animal Husbandry Building.* Professor WING, Assistant Professors HARPER and SAVAGE.

Prerequisite. Animal Husbandry 1.

Practice in scoring animals, including critical descriptions of animal form.

12. **Advanced Course in the Principles of Breeding Animals.** Throughout the year. One to three hours. Lectures (1) F, 11. *Animal Husbandry Building.* Professor WING and Assistant Professor HARPER.

Prerequisite. Animal Husbandry 1.

Lectures, conferences, and reports, including statistical methods as applied to breeding animals. The work of the first term will consist largely of practice in making reports on statistical problems. The work of the second term will be largely individual and will afford opportunity for intimate study of the various breeds of improved stock.

14. **Advanced Course in the Principles of Feeding.** First term. Two hours. Lectures and reports (2) T Th, 9. *Animal Husbandry Building.* Professor WING and Assistant Professor SAVAGE.

Prerequisite. Animal Husbandry 1. Must be elected by at least five students.

20. **Animal Husbandry.** Second term. Three hours. Lectures (3) T Th S, 9. Practice (1) W, 11–1. *Animal Husbandry Building.* Professor WING, Assistant Professors HARPER and SAVAGE.

Prerequisites. None. Special course for students in the New York State Veterinary College. Not open to students in the College of Agriculture.

The principles of breeding and feeding animals, with the history of improved breeds. Practicums in compounding rations and in stock judging.

Excursions and Inspection Trips. The following excursions and inspection trips are scheduled for the year 1910–11: To the International Live Stock Show at Chicago, immediately after Thanksgiving Day; to the breeders and herds in the vicinity of Syracuse, immediately preceding the Easter vacation; to the stock yards and slaughter houses in Buffalo and to the breeders in the vicinity, sometime in May. These excursions are elective.

Biology

1. **General Biology.** Throughout the year. Three hours. Lectures (2) T Th, 10. *Auditorium.* Practice (1) M T W Th or F, 2–4:30 or S, 8–10:30. *Main 302.* Assistant Professor NEEDHAM, Professor COMSTOCK, and Messrs. MATHESON and LLOYD.

Prerequisites. None.

This is an elementary course designed to acquaint the general student with the main ideas of biology through selected practical studies of the phenomena on which biological principles are based. Both lectures and laboratory work will deal with such topics as: the interdependence of organisms, the simpler organisms, organization and phylogeny, oogenesis and ontogeny, heredity and variation, natural selection and adaptation, segregation and mutation, the life cycle, metamorphosis and regeneration, and the responsive life of organisms. The object of so general a course is to give a bird's eye view of the biological field and an elementary acquaintance with the principles of development.

This course and Entomology 22 and 23 may be taken to meet the requirement of Biology for entrance to the Medical College.

Entomology and General Invertebrate Zoology

[1. **Invertebrate Zoology.** Not given by this department in 1910-11. See course 1 in Department of Vertebrate Zoology in the College of Arts and Sciences.]

2. **Morphology of Invertebrates.** Either term. Two or more hours. Lectures, none. Practice by appointment. *Main 301.* Assistant Professor MacGillivray.

Prerequisites. None.

The comparative study of the anatomy of representatives of the principal groups of invertebrates.

3. **General Entomology.** First term. Two or three hours. Lectures (2) M W, 9. *Main 392.* Professor Comstock. Practice (1) for those who have not had courses 4 and 5, Th or F, 2-4:30. *Main 301.* Assistant Professor MacGillivray.

Prerequisites. Biology 1 or Zoology 1.

Lectures on the characteristics of the orders, suborders, and the more important families, and on the habits of representative species. The practical exercises include a study of the structure of insects and practice in their classification.

4. **Elementary Morphology of Insects.** Either term. Two or three hours. Lectures, none. Laboratory open daily ex. S, 8 to 5. *Main 391.* Assistant Professor W. A. Riley and Mr. ———.

Prerequisites. None.

An introductory laboratory course, required of all students planning to do advanced work in the Department of Entomology.

5. **Elementary Systematic Entomology.** Either term. Three hours. Lectures, none. Laboratory open daily ex. S., 8 to 5. *Main 301.* Assistant Professor MacGillivray and Mr. ———

Prerequisite. Entomology 4.

A study of the wing venation of insects and the identification of specimens belonging to the more important orders and families. An introductory laboratory course required of all students planning to do advanced work in the Department of Entomology.

6. **Advanced Systematic Entomology.** Either term. Three hours. Lectures, none. Practice by appointment. *Main 301.* Assistant Professor MacGillivray.

Prerequisite. Entomology 5.

A training course in the identification and interpretation of obscure characteristics used in the classification of insects.

7. **Histology of Insects.** Throughout the year. Three or more hours. Lectures (1) first term, Th, 11. *Main 392.* Practice, either term by appointment. Assistant Professor W. A. Riley

Prerequisites. Entomology 4 and 5.

Designed for students of general zoology, as well as for those preparing for research in insect morphology.

8. **Economic Entomology.** Second term. Two hours. Lectures (2) M W, 9. *Main 392.* Assistant Professor Herrick.

Prerequisite. Entomology 3.

Discussion of the more important insect pests and of methods of controlling them. At opportune times the class will be taken into the field to observe insect pests at work.

9. **Advanced Economic Entomology and Insectary Methods.** Second term. Two hours. Lectures, none. Seminar, field and laboratory work by appointment. *Insectary.* Assistant Professor HERRICK.

Prerequisites. Open only to graduates and to undergraduates who have had Entomology 3, 4, 5, and 8.

Economic problems connected with applied entomology, discussed, reported upon, and field observations made. Experimental methods in breeding, photographing, investigating, and controlling insects discussed and studied. Designed for advanced students in entomology who desire to fit themselves for Experiment Station work.

10. **Classification of the Coccidae.** Second term. Five hours. Lectures (1) by appointment. Practice by appointment. *Main 301.* Assistant Professor MACGILLIVRAY.

Prerequisite. Entomology 6.

A course designed to familiarize the student with the more injurious species of scale insects, the methods of preparing specimens for study, and the systematic arrangement of the species.

11. **Morphology and Classification of the Arachnida.** Either term. Three or more hours. Lectures, none. Practice by appointment. Professor COMSTOCK and Miss STRYKE.

Prerequisites. Open only to graduates.

12. **Morphology and Development of Insects.** Second term. Two hours. Lectures (2) T Th, 9. *Main 392.* Professor COMSTOCK and Assistant Professor W. A. RILEY

Prerequisites. Entomology 1, 3, 4, and 5. Students are advised to take Entomology 7, also, before taking this course.

14. **German Entomological Reading.** Either term. One hour. W, 7-9 P. M. *Main 391.* Assistant Professor W. A. RILEY.

Prerequisites. Open only to advanced students in entomology or zoology.

16. **Elementary Economic Entomology.** First term. Two hours. Lectures (2) T Th, 9. *Main 392.* Assistant Professor HERRICK.

Prerequisites. None. A course designed for special students. Not open to students who are prepared to take Entomology 8.

Discussion of insect pests in general, with remedial suggestions. Occasionally, the class will be taken to the field to observe insect pests at work.

[17. **Literature of Systematic Entomology.** First term. Two hours. Lectures (2) W F, 8. *Main 392.* Not given in 1910–11. Assistant Professor MACGILLIVRAY.]

Prerequisite. Entomology 5.

A systematic study of bibliographies, indexes, and general entomological literature; the preparation of catalogues of insects; the evolution of the rules of zoological nomenclature; and the methods of determining the priority of generic and specific names.

[18. **Embryology of Insects.** Second term. One hour. Lectures (1) Th, 9. *Main 392.* Not given in 1910-11. Assistant Professor W. A. RILEY.]

Prerequisites. Entomology 3, 4, and 5.

Alternates with Course 12.

19. **General Limnology.** Second term. Three hours. Lectures (1) at an hour to be arranged. Practice (2), laboratory or field work T, 2-4:30, and a second period by appointment. *Main 302 and Biological Field Station.* Assistant Professor NEEDHAM and Mr. LLOYD.

Prerequisites. Open only to students who have taken or are taking General Biology 1 and Entomology 3.

An introduction to the study of the life of inland waters. Aquatic organisms in their qualitative, quantitative, seasonal, and ecological relations.

20. **Research in Limnology.** Throughout the year. Three or more hours. Practice by appointment. *Main 302 and Biological Field Station.* Assistant Professor NEEDHAM.

Prerequisite. Entomology 19 or its equivalent.

A course consisting of laboratory and field work.

22. **Animal Parasites and Parasitism.** First term. Two hours. Lectures (1) T, 8. Practice (1) M or T, 2-4:30. *Main 392.* Assistant Professor W. A. RILEY.

Prerequisites. Must be preceded or accompanied by Biology 1 or Zoology 1. Entomology 3 is also advised.

A consideration of the origin and biological significance of parasitism, and of the structure, life-history, and economic relations of representative animal parasites.

23. **The Relations of Insects to Disease.** Second term. Two hours. Lectures (1) T, 8. Practice (1) T, 2-4:30. *Main 392.* Assistant Professor W. A. RILEY.

Prerequisites. Must be preceded or accompanied by Biology 1 or Zoology 1. Entomology 3 is also advised.

Considers primarily the agency of insects and other arthropods in the causation or the transmission of diseases of man and animals.

24. **The Classification of Immature Insects.** Second term. Two hours. Lectures, none. Practice (2) by appointment. *Main 301.* Assistant Professor MACGILLIVRAY.

Prerequisite. Entomology 5.

A course in the taxonomy of nymphs, larvæ, and pupæ.

27. **Research in Morphology of Insects.** Throughout the year. Three or more hours. Lectures, none. Laboratory open daily ex. S, 8-5, S, 8-1. *Main 391.* Professor COMSTOCK and Assistant Professor W. A. RILEY.

Prerequisites. Entomology 3, 4, and 5.

Special work arranged with reference to the needs and attainments of each student.

28. **Research in Systematic Entomology.** Throughout the year. Three or more hours. Lectures, none. Laboratory open daily ex. S, 8–5, S, 8–1. *Main 301.* Professor COMSTOCK and Assistant Professor MACGILLIVRAY.

Prerequisites. Entomology 3, 4, 5, and 6.

Special work arranged with reference to the needs and attainments of each student.

29. **Research in Economic Entomology.** Throughout the year. Three or more hours. Lectures, none. Laboratory and field work by appointment. *Insectary.* Professor COMSTOCK and Assistant Professor HERRICK.

Prerequisites. Entomology 3, 4, 5, and 8.

In most cases it is impracticable to complete an investigation in this subject during the college year. Students must arrange to conduct their observations during the growing season.

Seminar. Throughout the year. Monday, 4:30 to 5:30. *Main 392.*

The work of an entomological seminar is conducted by the Jugatæ, an entomological club which meets for the discussion of current literature and of the results of investigations. Attendance at the meetings may be counted as laboratory work.

Dairy Industry

1. **Milk Composition and Tests.** Either term. Two hours. First term, lectures (1) T, 11. *Dairy Building 222.* Practice (1) M or T, 2–4:30 in Oct. and Nov., 3:30–5:45 in Dec. and Jan., or S, 8–10:30 throughout the term. *Dairy Building 232.* Second term, lectures (1) T, 11. *Dairy Building 222.* Practice (1) M, 8–10:30 or 2–4:30. *Dairy Building 232.* Assistant Professor Ross.

Prerequisites. None.

The topics considered are secretion and composition of milk, samples, lactometer, Babcock fat test, acid tests, moisture test, salt test, preservative tests.

2. **Butter Making.** Either term. Three hours. Lectures (1) F, 11. *Dairy Building 222.* Practice (2) in one 5-hour period each week, T, 1–6, F, 1–6, or S, 8–1. *Dairy Building.* Mr. GUTHRIE.

Prerequisites. Must be preceded or accompanied by Dairy Industry 1.

This course considers the principles and practice of butter making in farm dairies and creameries; cream separation, pasteurization, starters, churning, marketing, judging, etc.

3. **Cheese Making.** First term. Three hours. Lectures and textbook (1) Th, 11. *Dairy Building 222.* Practice (2) by appointment. Each exercise will require four to six hours, but the total hours will not exceed the equivalent of two periods or five hours per week. *Cheese Laboratory.* Assistant Professor ———.

Prerequisites. Must be preceded or accompanied by Dairy Industry 1.

In this course are considered the principles and practices of cheddar cheese-making; apparatus and buildings; factory bookkeeping.

4. **Elementary Bacteriology.** Either term. Three hours. Lectures will be given in connection with the laboratory practice. First term, practice (3) M W F, 2–4:30. Second term, practice (3) M, 10–1, W F, 8–11. *Dairy Building 122.* Professor STOCKING, Mr. COOK and Miss WING.

Prerequisites. None.

The purpose of this course is to familiarize the student with laboratory methods; preparation of culture-media; sterilization; methods of studying bacteria; morphology and cultural characteristics of bacteria.

Dairy Mechanics. See Farm Mechanics 4.

6. **Market Milk and Milk Inspection.** Second term. Two hours. Lectures (1) W, 12. *Dairy Building 222.* Practice (1) S, 8–10:30 or 10:30–1. *Dairy Building.* Professor STOCKING and Assistant Professor Ross.

Prerequisites. Must be preceded or accompanied by Dairy Industry 1.

Attention is given to the production and control of market milk, with special reference to its improvement; milk as food: shipping stations; transportation and sale; pasteurizing; standardizing; certified milk; milk laws; duties of milk inspectors; apparatus and buildings. The practice includes also visiting dairies in the vicinity of Ithaca. A short inspection trip in the neighboring counties may be arranged.

7. **Advanced Testing Laboratory Course.** Second term. Two hours. Lectures, none. Practice (2) T Th: in February, 3:30–5:45; after March 1st, 2–4:30. *Dairy Building 232.* Assistant Professor Ross.

Prerequisites. Dairy Industry 1. Not open to freshmen except by special permission.

This course includes work in such subjects as the determination of moisture and dry matter in dairy products; commercial tests for casein; various tests for butter fat; commercial tests for butter and oleomargine, preservatives and adulterations; milk modification.

8. **Dairy Bacteriology.** Second term. Four hours. Lectures (1) Th, 11. *Dairy Building 222.* Practice (3) M W F, 2–4:30. *Dairy Building 122.* Professor STOCKING and Mr. COOK.

Prerequisites. Must be preceded or accompanied by Dairy Industry 1, and preceded by Dairy Industry 4 or its equivalent.

This course deals with the sources of milk bacteria and methods of controlling their growth; bacteriological studies of market milk and other dairy products; different species of dairy bacteria; making of starters; effect of straining, separation, pasteurization and temperature; bacteriological methods of city milk inspection.

9. **Advanced Butter Making.** Second term. Two hours. Lectures, none. Practice (2) one long period each week by appointment. The periods will begin at the opening of the creamery in the morning and will close at 12 o'clock. Practice will not begin until after the close of the Winter-Course. *Dairy Building.* Mr. GUTHRIE.

Prerequisites. Must be preceded by a good record in Dairy Industry 2.

The practice will consist in practical work in the creamery, where 600 to 1000 pounds of butter are made daily.

10. **Fancy Cheese Making.** Second term. Two hours. Lectures, none. Practice (2) by appointment. Each exercise will require two to six hours, and the total hours will be the equivalent of five hours per week. *Dairy Building.* Professor STOCKING, Assistant Professor ——— and Mr. COOK.

Prerequisites. Must be preceded by Dairy Industry 1 and 3.

The manufacture of certain brands of fancy cheese is given attention.

11. **Dairy Buildings and Equipment and Business Methods.** Second term. One hour. Lectures (1) M, 11. Problems will be assigned to be worked outside of the lecture hour. *Dairy Building 222.* Professor STOCKING, Assistant Professors ——— and Ross, and Messrs. AYRES and GUTHRIE.

Prerequisites. Must be preceded or accompanied by Dairy Industry 1 and any two of the following: 2, 3, 6, and Farm Mechanics 4.

This course will include location, plans and construction of buildings suitable for creameries, cheese factories and market milk plants; water-supply and sewage disposal; equipment for special lines of dairy work; records; business management, including buying and selling dairy products.

12. **Seminar.** Either term. One hour. T, 12. *Dairy Building.* Professor STOCKING, Assistant Professor ROSS, and Mr. GUTHRIE.

Prerequisites. This course is for advanced students and is required of graduate students taking work in the Department of Dairy Industry.

13. **Research.** Either term. One to two hours by arrangement. Lectures, none. Practice by appointment. *Dairy Building.* Professor STOCKING, Assistant Professor ROSS, and Mr. GUTHRIE.

Prerequisites. For advanced students.

Special problems in any line of dairy work can be taken up in this course according to the needs of the student. Facilities are provided for investigational work.

14. **General Agricultural Bacteriology.** First term. Three hours. Lectures (1) F, 10. *Dairy Building 222.* Practice (2) T Th, 2–4:30. *Dairy Building 122.* Professor STOCKING, Mr. COOK, and Miss WING.

Prerequisites. None. This course is open to regular and special students who desire a general knowledge of bacteria in relation to agricultural problems, but who cannot spend time for the more thorough courses.

The characteristics of bacteria, and the place of bacteria in nature; fermentations; bacteria in air, water and sewage; the manure heap; soil bacteria; nitrogen fixation; relation of bacteria to the dairy and its products; the preservation of farm products, including fruits, vegetables, vinegar, silage, etc.

15. **Bacteriology for the Home.** Second term. Three hours. Lectures will be given in connection with the laboratory practice. Practice (3) T Th, 2–4:30, S, 10:30–1. *Dairy Building 122.* Professor STOCKING and Miss WING.

Prerequisites. Must be preceded by Dairy Industry 4 or its equivalent.

This course considers the relation of bacteria to air and water, and to milk and other foods; canning and preserving; molds and yeasts in their relation to household problems; decay of fruits; home sanitation.

Drawing

1. **Mechanical Drawing.** Either term. Two hours. Lectures during practice. Practice (2) M W, 2–4:30. *Dairy Building 341.* Assistant Professor BAKER.

Prerequisites. None.

An elementary course to enable the student to make and read simple working drawings, plans, elevations, etc.

2. **Freehand Drawing.** Throughout the year. Two hours. Lectures during practice. Practice (2). First term, T Th morning hours by arrangement. Second term, W F morning hours by arrangement. *Dairy Building 371.* Assistant Professor BAKER.

Prerequisites. None.

An elementary course for the development of graphic expression applicable to scientific studies. Of special value to those expecting to go into teaching, nature-study or biological research.

3. **Applied Drawing.** Either term or throughout the year. Two or more hours. Lectures during practice. Practice by arrangement. *Dairy Building 371.* Assistant Professor BAKER.

Prerequisites. Drawing 2 or its equivalent.

Personal instruction in problems of scientific drawing in pencil, pen and ink, wash, and water-color.

NOTE.—No credit is given for drawing as art study, but students desiring to engage in such study are encouraged to do so and may receive instruction in any medium.

Advanced students and graduates engaged in thesis or research work requiring a considerable amount of drawing are encouraged to do such drawing in this department, or, if this can not be done conveniently, to bring it in for occasional criticism and suggestion.

Extension Teaching

1. **Extension Work.** First term. Two hours. Lectures and practice (2) M Th, 12, or T F, 12. *Auditorium.* Criticism by appointment. Professor TUCK and Mr. WHEELER.

Prerequisites. Open to juniors and seniors, others by arrangement.

Lectures and discussions on problems of university extension in agriculture. Practice in oral and written presentation of topics in agriculture, with criticism and individual appointments on the technique of public speech. Designed to acquaint students with parliamentary practice, to encourage interest in public affairs, and to train for effective self-expression in public. A few juniors and seniors will be sent out into the state to address meetings.

2. **Extension Work.** Second term. Two hours (or three hours by arrangement). Lectures and practice (2) M Th, 12, or T F, 12. *Auditorium.* Criticism by appointment. Professor TUCK and Mr. WHEELER.

Prerequisites. Extension 1, of which Extension 2 is a continuation.

The Second Annual Eastman Stage in public speaking will take place during the month of February. The prize, $100 in gold, is given by Mr. A. R. Eastman of Waterville, N. Y. The Stage is open to all students in the College of Agriculture. Special training will be given to competitors. The object of the prize is to develop qualities of personal leadership in rural affairs.

Farm Crops and Farm Management

Farm Crops

1. **Cereals.** First term. Four hours. Lectures (3) M W F, 10. *Agronomy 192.* Practice (1) Th or F, 2–4:30. *Agronomy 202.* Assistant Professor WHITE.

Prerequisites. Soils 1.

Lectures, recitations, and laboratory practice on the history, production and marketing of cereal crops. Field trips are taken on all laboratory days when the weather is suitable.

2. **Forage Crops, Potatoes and Miscellaneous Crops.** Second term. Four hours. Lectures (3) M W F, 10. *Agronomy 192.* Practice (1) Th or F, 2–4:30. *Agronomy 202.* Assistant Professor WHITE.

Prerequisites. Soils 1 or 4 and Farm Crops 1.

Lectures, recitations, and laboratory practice on the history, production, and marketing of potatoes, field beans, forage crops, and miscellaneous crops.

3. **Cereals and Forage Crops.** First term. Four hours. Lectures (3) M W F, 12. *Agronomy 192.* Practice (1) M or T, 2–4:30. *Agronomy 202.* Professor WARREN and Mr. DYNES.

Prerequisites. Must be preceded or accompanied by Soils 1.

A brief course in which consideration is given to a few of the most important crops. Designed for those who cannot take Farm Crops 1 and 2.

4. **Advanced Farm Crops.** Second term. Two hours. Hours to be arranged. *Agronomy 202.* Assistant Professor WHITE.

Prerequisites. Farm Crops 1 or 3. Open to a limited number of students.

A further study of Farm Crops, including lectures and laboratory practice.

5. **Research.** Either term or throughout the year. Two or more hours. By appointment. Professor WARREN, Assistant Professor WHITE and Mr. LIVERMORE.

Prerequisites. Permission to register, Farm Crops 1 and 2, or 3, and must be accompanied by Farm Crops 6. The number of students will be limited.

Investigation of special farm crop subjects. Also a study of current experiment station literature.

6. **Seminar.** Second term. One hour. Hours to be arranged. *Agronomy 192.* Professor WARREN, Assistant Professor WHITE and Mr. LIVERMORE.

Prerequisites. Required of all students taking research work in Farm Crops or Farm Management. A limited number of students who are taking Farm Crops 4 or Farm Management 2 may be admitted. Not open to other students.

Farm Management

1. **Farm Management.** Second term. Four hours. Lectures (3) M W F, 11. *Main 392.* Practice (1) M or T, 2–4:30. On days when farms are visited the laboratory work will not close at 4:30. *Agronomy 202.* Professor WARREN and Mr. LIVERMORE.

Prerequisites. As many as possible of the following courses should precede or accompany Farm Management: Farm Crops 1 and 2, or 3, Animal Husbandry 1, Pomology 1 and 2, Farm Mechanics 3 and 20, Poultry Husbandry 1, Dairy Industry 1, and Farm Practice. Students who have had or who are taking Farm Crops and Animal Husbandry, and who have passed the Farm Practice examination, will be admitted to the class. Certain other combinations of the above subjects will also be accepted after conference. It is recommended that this subject be taken in the junior year.

Lectures, recitations, and laboratory practice on elementary farm accounting, selection and purchase of farms, cost and relative profit of various farm operations and systems of farming, organization of the farm business with preparation of plans for the management of specific farms, with financial estimates. Trips to farms are taken on all laboratory days when the weather is suitable. There will be two one-day excursions, about May 13–14, estimated to cost not more than $5, to farms at some distance from Ithaca.

2. **Advanced Farm Management.** First term. Two hours. W, 2–5. *Agronomy 192.* Professor WARREN, Messrs. LIVERMORE and ———.

Prerequisite. Farm Management 1.

A further study of farm management, including lectures, problems, reading, and trips to successful farms. Expenses for the excursions are estimated to cost not more than $5.

3. **Research.** Either term or throughout the year. Two or more hours. By appointment. Professor WARREN and Mr. LIVERMORE.

Prerequisites. Permission to register, Farm Management 1, and must be accompanied by Farm Crops 6. The number of students will be limited.

Investigation of special problems in farm management.

Farm Mechanics

3. **Farm Mechanics.** Either term. Three hours. First term, lectures (2) W F, 8. *Agronomy 152.* Practice (1) M T or W, 2–4:30. *Agronomy 31.* Second term, lectures (2) T Th, 12. *Agronomy 152.* Practice (1) M T or W, 2-4:30. *Agronomy 31.* Assistant Professor H. W. RILEY and Messrs. EVANS, BURDICK, and KEPHART.

Prerequisites. None. Students are urged to take Drawing 1 in preparation for this course.

A study of the principles of operation, the details of construction, and the practical operation and care of: A—Machinery, including gasoline engines, water wheels, devices for transmitting power, farm lighting systems, hydraulic rams, pumps, spray nozzles, spraying outfits, water-supply outfits, plain soldering, and simple pipe-fitting for water. B—Implements for tillage, seeding, and harvesting, with a discussion of the special mechanical features of some implements now on the market.

4. **Dairy Mechanics.** First term. Two hours. Lectures (1) M, 8. *Agronomy 152.* Practice (1) M T or W, 2–4:30. *Agronomy 31.* Assistant Professor H. W. RILEY and Messrs. EVANS and BURDICK.

Prerequisites. Permission to register. Primarily for students specializing in Dairy Industry.

A brief course, in which attention is given to the installation, care, and operation of the steam boiler and its accessories, steam and gasoline engines, pumps and hydraulic rams; installing shafting, pulleys and belts; soldering; pipe-fitting for steam and for water.

19. **Research in Farm Mechanics.** Either term. One or more hours. Lectures, none. Practice by appointment. Assistant Professor H. W. RILEY.

Prerequisites. Permission to register, and Farm Mechanics 3 or its equivalent, coupled with natural ability in mechanical lines.

Special work in problems in farm mechanics for which the department can provide adequate facilities.

20. **Farm Engineering.** Either term. Three hours. First term, lectures (2) T Th, 12. *Agronomy 152.* Practice (1) M T or Th, 2–4:30 in the field. Second term, lectures (2) W F, 8. *Agronomy 152.* Practice (1) M T or Th, 2–4:30 in the field. Assistant Professor H. W. RILEY and Mr. ROBB.

Prerequisites. Plane Geometry. Students are urged to take Drawing 1 in preparation for this course.

A study of the practical solution of the problems involved in connection with farm water-supply and sewage disposal; surveying and mapping the farm; locating, digging and laying drains; laying out building foundations; road construction and maintenance, with a discussion of the New York State Highway Law. From data obtained in the field a drainage map will be drawn for one of the fields near the college.

28. **Advanced Work in Farm Engineering.** Either term. One or more hours. Lectures, none. Practice by appointment. Assistant Professor H. W. RILEY

Prerequisites. Permission to register, and Farm Mechanics 20 or its equivalent.

A course intended to provide opportunity for students to work out special problems on their home farms or on selected farms, in connection with advanced problems in other departments.

Farm Practice

1. **Farm Practice.** Either term. No University credits. Hour and place by appointment. Professor STONE and Mr. MINNS.

Prerequisites. None.

An elective course designed to assist students in meeting the requirements of farm practice demanded by the College.

2. **Farm Structures.** First term. Two hours. Lectures and quizzes (2) T Th, 8. *Agronomy 152.* Mr. MINNS.

Prerequisites. None. Intended for special students.

A study of building materials used on the farm (including concrete), the principle of construction for barns, stables, and other farm buildings, and their application in practice. A discussion of home-made farm appliances and fences is included. Lectures will be supplemented by assigned reading. A set of working drawings of specified subjects will be required of each student.

3. **Farm Structures.** Second term. Two hours. Lectures and quizzes (2) T Th, 8. *Agronomy 152.* Mr. MINNS.

Prerequisite. Drawing 1 or its equivalent. Not given for less than six students.

Similar to Farm Practice 2, but intended for more advanced and prepared students.

Home Economics

A four-year course in Home Economics is planned for students desiring to specialize in this work. The first two years of the course follow the work as outlined for all students in the College of Agriculture, with the addition

of some courses not required in the regular schedule. The last two years permit specialization along some one or more of the branches included under the term home economics. As the course develops, new subjects will be incorporated. All students who register in this department must report to the department at the beginning of the Freshman year.

1. **Survey Course in Home Economics.** Throughout the year. Four hours. Lectures (3) M W F, 9. *Main 403.* Practice (1) M, 2–5. *Main 492.* Miss ROSE, Miss VAN RENSSELAER and Miss BAILEY.

Prerequisites. None. May be taken any year.

This course is intended for students registered in any department in the University who desire a general knowledge of some of the subjects grouped under the term home economics. The lectures include a discussion of foods, food preparation and human nutrition, household sanitation, household management and house-planning.

3. **Foods.** Throughout the year. Four hours. Lectures (2) W F, 11. *Main 403.* Practice (2): first term, W F, 2–5; second term, T Th, 2–5. *Main 492.* Miss ROSE.

Prerequisites. General Biology 1, Chemistry 1 and 6. This course should be taken in the sophomore year.

A course for establishing a fundamental knowledge of foods. The lectures will include a discussion of the composition and characteristics of food-stuffs; principles of selecting foods and methods of preparing them; food preservation and adulteration; comparative nutritive and economic value of various food combinations. Laboratory practice will be given to apply scientific principles in food preparation.

4. **House Sanitation.** Second term. Two hours. Lectures (2) T Th, 9. *Main 403.* Miss VAN RENSSELAER.

Prerequisites. Dairy Industry 15 must precede or accompany this course. Intended for juniors.

The lectures in this course include the sanitary conditions of the house and site; conditions for health and care of sick; the relation of bacteriology to the household in cleaning, in the preservation of foods, in disease, in disinfection.

6. **Human Nutrition.** Throughout the year. Four hours. Lectures (2) W F, 10. *Main 403.* Practice (2): first term, T Th, 2–5; second term, W F, 2–5. *Main 492.* Miss ROSE.

Prerequisites. Home Economics 1, Physics 1, 5, 10, Human Physiology 3, Chemistry 32. Should be taken in the junior year.

A course for the development of a working knowledge of human nutrition. A study of methods of investigating dietary problems and of the practical means of applying scientific principles in planning family and institution dietaries; consideration of special problems of nutrition, as in infant feeding and feeding in cases of abnormal metabolism. Laboratory work will include, as far as possible, practice in planning and preparing dietaries.

9. **House Planning.** First term. Three hours. Lectures (2) T Th, 10. Practice (1) M, 2–4:30. *Main 403.* Mrs. YOUNG and Miss VAN RENSSELAER.

Prerequisite. Drawing 1. Should be taken in the junior year.

An elementary course for the developing of economic house plans in accordance with architectural principles. Besides drawing plans, the course includes discussions of the building site, building materials, elements of construction, laying out the grounds, and criticisms of interior design.

10. **Household Art.** Second term. Three hours. Lectures (2) T Th, 10. Practice (1) M, 2–4:30. *Main 403.* Mrs. YOUNG.

Prerequisites. Drawing 2. Should be taken in junior year.

A course for the development of artistic expression in the individual. The lectures of this course will apply principles of color and design to questions of interior decorating and furnishing. Students experiment with color combinations for decorative schemes, and with textile combinations for curtain-stuffs, wearing apparel, etc.

12. **Woman and the Family.** First term. Three hours. Lectures (3) M W F, 12. *Main 403.* Miss VAN RENSSELAER.

Prerequisites. None. Intended for juniors.

This course embraces a study of woman and the family through the early ages to the present time. It treats survivals with reference to various characteristics and conditions of woman in the family and the state. Woman's work, her industrial and economic condition from the beginning are studied with reference to present conditions and their effect upon society.

14. **Household Management.** Throughout the year. Two hours. Lectures (2), to be arranged. *Main 403.* Miss VAN RENSSELAER.

Prerequisites. Political Science 51 must precede or accompany this course. Intended for seniors.

This course includes a study of the family income, cost of living, household accounts, problems of domestic service, methods of housekeeping, equipment, marketing; housekeeping for large numbers.

20. **Special Problems.** Throughout the year. Credit and hours by arrangement. *Main 403.* Miss VAN RENSSELAER, Miss ROSE and Mrs. YOUNG.

Prerequisites. A fundamental knowledge of Home Economics. Open to senior or graduate students in Home Economics, or to other qualified students by special arrangement.

A course intended for the development of the individual student in special phases of work. Special facilities will be arranged for those intending to teach Home Economics, which will include a consideration of the logical methods of organizing and developing courses of study in Home Economics. Problems of original investigation will be planned for graduate students or undergraduate students who have proved themselves capable of undertaking such work.

22. **Seminar.** Throughout the year. One hour. By arrangement. *Main 403.* Miss ROSE, Miss VAN RENSSELAER and Mrs. YOUNG.

Required of Home Economics students. Open only to them.

Horticulture

Floriculture

15. **Floriculture.** First term. Three hours. Lectures (2) W F, 9. *New Greenhouses.* Practice (1) W or F, 2–4:30. *New Greenhouses.* Mr. BEAL and Mr. COSH.

Prerequisites. Botany 1 and 2, or equivalent.

The culture, diseases, botany and history of florists' plants, and methods of greenhouse management. Practice in the greenhouses. Those desiring more work in the greenhouse can arrange for one or two additional periods with credit.

16. **Florists' Plants and Garden Flowers.** Second term. Three hours. Lectures (2) W F, 9. *New Greenhouses.* Practice (1) W or Th, 2–4:30. *New Greenhouses.* Mr. BEAL and Mr. COSH.

Prerequisites. Botany 1 and 2, or equivalent.

A continuation of Floriculture 15, with outdoor gardening in the spring.

19. **Greenhouse Construction.** First term. Two hours. Lectures (1) M, 12. *Main 292.* Practice (1) Th, 2–4:30. *Main 201.* Mr. BEAL and Mr. WORK.

Prerequisites. Drawing 1.

The development of the modern greenhouse; types of houses, materials and methods of construction, installation of heating systems, etc. Laboratory practice in erecting section of cypress and iron frame houses, and in planning and estimating the cost of commercial ranges. The class will participate in a required excursion to Elmira on December 3d.

21. **Investigation in Floriculture.** Throughout the year. One, two, or three hours. Lectures, none. Consultations by appointment. Mr. BEAL.

Prerequisites. Permission to register. Designed primarily for upperclassmen and graduate students.

The investigation of problems in the growing of cut flowers, exotics, and garden flowers, hybridizing, and studying varieties.

Olericulture

24. **Vegetable Gardening.** First term. Three hours. Lectures (2) T Th, 12. *Main 292.* Practice (1) T, 2–4:30. *Main 202.* Mr. WORK and Mr. COSH

Prerequisites. Botany 1 and 2.

A systematic study of the characters and qualities of the important vegetables, with reference to botanical relationships, adaptation for home and commercial use, harvesting, marketing and storing. A study of the principles of vegetable gardening in relation to truck growing, forcing vegetables under glass, and the home garden. Laboratory work consists of study of varieties and greenhouse practice.

25. **Vegetable Gardening.** Second term. Three hours. Lectures (2) T Th, 12. *Main 292.* Practice (1) T, 2–4:30. Mr. WORK and Mr. COSH.

Prerequisites. Botany 1 and 2.

Lectures a continuation of Olericulture 24. A study in detail of the methods employed in the production of vegetables for home and commercial purposes. Laboratory exercises consist of greenhouse practice, care of coldframes, hotbeds, and planting a home garden.

28. **Vegetable Gardening.** Second term. Three hours. Lectures (1) W, 9. *Main 232.* Practice (2) by appointment. *Forcing-houses.* Mr. WORK and Mr. COSH.

Prerequisites. Olericulture 24 and 25.

A study in detail of the important vegetable crops forced under glass. Laboratory work will consist in the actual practice of the methods employed in the forcing of vegetables. The class will participate in a required excursion to Rochester on May 5th and 6th.

Advanced and Special Courses

32. **Elementary Horticulture.** Throughout the year. Two hours. Lectures (1) M, 12. *Main 232.* Practice (1) M, 2–4:30. *Greenhouse and by appointment.* Professor CRAIG and Mr. HUNN.

Prerequisites. Must be preceded or accompanied by Botany 1.

This course aims to emphasize principles and practices involved in the cultivation of garden plants grown for pleasure or profit. It includes the propagation, botany, culture, and economic uses of plants. Some attention is also given to garden-making. Designed for teachers of nature-study or of elementary agriculture.

33. **Nuciculture.** Second term. Two hours. Lectures (2) M W, 11. *Main 201.* Professor CRAIG.

Prerequisites. Training in systematic botany.

Lectures on the practical and systematic phases of nut-culture with special reference to the cultivation and improvement of the forms native to the United States.

The Morris collection of edible nuts of the world in the Department of Horticulture furnishes abundant material for illustrating the lectures.

34. **Subtropical Pomology.** First term. Three hours. Lectures (2) T Th, 11. *Main 232.* Laboratory (1) T, 2–4:30. *Main 201.* Professor CRAIG and ———.

Prerequisites. None.

A study of citrus and other tropical fruits, with special reference to American conditions. Copiously illustrated. Laboratory work in describing and judging the various fruits.

35. **Literature of Horticulture and Landscape Gardening.** First term. Three hours. Lectures (3) M W F, 11. *Main 232.* Professor CRAIG.

Prerequisites. Open to juniors and seniors, and required of graduates.

A comprehensive survey of the writings of European and American authors, with special reference to the evolution of horticultural methods.

36. **Evolution of Plants.** Second term. Three hours. Lectures (3) M W F, 11. *Main 232.* Professor CRAIG.

Prerequisites. Open to juniors and seniors, and required of graduates.

Historical development of theories of evolution; recent theories, including a careful examination of present-day methods. Practice in the greenhouse in the technique of plant-breeding.

37. **Investigation.** Either term. One or more hours. Lectures, none. Consultations by appointment. Professor CRAIG.

Prerequisites. For advanced students and graduates.

The student is assigned a subject, which, as far as possible, combines original research with bibliographical methods.

38. **Seminar.** Throughout the year. One hour. T, 4:35–5:45 P. M. Professor CRAIG.

Prerequisites. Required of advanced students who elect Horticulture 37, and of all graduate students.

Meteorology

1. **Meteorology and Climatology.** Second term. Three hours. Lectures (3) M W F, 10. *Dairy Building 222.* Professor WILFORD M. WILSON.

Prerequisites. None.

Lectures and weather observations. Designed to acquaint the student with the general circulation of the atmosphere; development, movement and conditions that attend cyclones, tornadoes, and special storms; practical weather forecasting from weather maps and local observations; the use of meteorological instruments; general and special climatology and its relation to agriculture.

Plant-Breeding

1. **General Plant-Breeding.** First term. Three hours. Lectures (2) T Th, 10. *Main 292.* Practice (1) F, 2–4:30. *New Greenhouses.* Assistant Professor GILBERT and Mr. DORSEY.

Prerequisites. None. Primarily for students who are planning to pursue practical farming and do not wish to take a more comprehensive course.

A study of the elements of plant-breeding, including variation, selection, and hybridization. The laboratory exercises are designed to give practice in measuring variation, making hybrids, and planning plant-breeding schemes adaptable to farm practice.

2. **Plant-Breeding.** Throughout the year. Three hours. Lectures (2) M W, 12. *Agronomy 192.* Practice (1) M, 2–4:30. *New Greenhouses.* Assistant Professor GILBERT and Mr. DORSEY. Special lectures will be given by members of the experimental staff.

Prerequisites. Botany 1 and 2, or their equivalents. Primarily for juniors and seniors and required of graduate students.

This course will undertake a careful consideration of the principles and practice of plant-breeding with reference to variation, selection and hybridization as factors in the amelioration of cultivated plants. Special consideration will be given to the methods and results of present-day plant-breeders.

4. **Biometry.** First term. One hour. Lectures and practice (1) by appointment. M, 8. *Agronomy 192.* Assistant Professor LOVE.

Primarily for graduate students. Required of major graduate students in Plant-Breeding.

This course will consist in a discussion and application of statistical methods as applied to problems in biology and practical breeding.

5. **Research.** Throughout the year. Two hours. By appointment. *Agronomy 311.* Assistant Professor GILBERT.

Prerequisite. Plant-Breeding 2 or its equivalent. Primarily for senior thesis work.

This course will give the student an opportunity to pursue a plant-breeding problem which will give him practice in bibliographical and research methods.

6. **Research.** Throughout the year. By appointment. *Agronomy 311.* Professor WEBBER, Assistant Professors LOVE and GILBERT.

Special work for a few advanced graduate students. Arranged with reference to individual aims and attainments.

Problems in plant-breeding, heredity, and general evolutionary topics.

7. **Seminar.** Throughout the year. Th, 2–4. *Agronomy 311.* Professor WEBBER, Assistant Professors LOVE and GILBERT.

Required of all graduate students in the department.

A seminar for the discussion of the fundamental problems of plant-breeding, heredity, and general evolution, methods of plant-breeding, etc.

Plant Industry Seminar

Throughout the year. W, 4:35–6 of each alternate week. *Main 292.* A union seminar, including the departments of Farm Crops, Soil Technology, Farm Practice, Farm Mechanics, Plant Pathology, Plant-Breeding, Plant Physiology, Economic Entomology, Horticulture, Rural Art and Meteorology. May be elected by students who are members of the seminar of any department in the College. Credit may be received for attendance when it takes the place of departmental seminar work.

For the discussion of topics relating to plant production in its broadest sense. Designed to bring together and correlate the departments of knowledge concerned with plant production and to give a greater breadth of view to the workers in these fields. Each department mentioned above will occupy one period in the presentation of some phase of its own subject. The remaining periods will be given to a consideration of current topics of general concern.

Plant Pathology

1. **Plant Pathology.** First term. Three hours. Lectures (1) F, 12. *Agronomy 152.* Practice (2) W F, 2–4:30, or Th, 2–4:30, S, 10:30–1. Professor WHETZEL and Mr. ANDERSON.

Prerequisites. Botany 1 and 2, or equivalent. Recommended for sophomores and juniors.

A fundamental course treating of the common diseases of cultivated plants, their nature, cause, and control. A prerequisite for all other courses in plant pathology. The practice sections must be taken in the couplets announced above.

2. **Principles of Plant Disease Control.** Second term. Three hours. Lectures (1) F, 12. *Agronomy 152.* Practice (2) W F, 2–4:30, or Th, 2–4:30, S, 10:30–1. Assistant Professor REDDICK and Mr. GREGORY. Assistant Professors GILBERT and H. W. RILEY will collaborate in this course.

Prerequisite. Plant Pathology 1. Recommended for sophomores and juniors.

A consideration of the vairous methods for the control of plant diseases, including sanitation, seed treatment, seed selection, spraying, tree surgery, immunization, etc.

3. **Laboratory Methods in Plant Pathology.** Throughout the year. One hour. Lectures (1) M, 12. *Agronomy 302.* Professor WHETZEL and Assistant Professor REDDICK.

Prerequisite. Plant Pathology 1. Required of all students doing advanced work.

4. **Etiology of Plant Diseases.** Throughout the year. Four hours. Lectures (2) W Th, 12. *Agronomy 302.* Practice (2) M T, 2–4:30. *Agronomy 302.* Professor WHETZEL, Assistant Professor REDDICK, Mr. GREGORY and Miss JENKINS.

Prerequisite. Plant Pathology 1.

Designed especially for students who desire to specialize in Plant Pathology. The taxonomy and phylogeny of plant disease-producing organisms.

[5. **Diseases of Field and Truck Crops.** Not given 1910–11. Alternating from year to year with Plant Pathology 7.]

[6. **Diseases of Fruit and Fruit Trees.** Second term. Three hours. Conference (1) T, 12. *Agronomy 302.* Practice (2) by appointment, M T W, 8–12. Not given in 1910–11. Assistant Professor REDDICK.]

Prerequisite. Plant Pathology 1.

Designed especially for students who expect to go into practical fruit-growing.

[7. **Diseases of Forcing-house and Florists' Crops.** First term. Three hours. Conference (1) T, 12. *Agronomy 302.* Practice (2) by appointment, M T W, 8–12. Not given in 1910–11. Professor WHETZEL.]

Prerequisite. Plant Pathology 1.

Designed especially for students specializing in forcing-house or floricultural work.

[8. **Dendropathology.** Second term. Three hours. Conference (1) F, 12. *Agronomy 302.* Practice (2) by appointment, Th F, 8–12. Not given in 1910–11. Professor WHETZEL and Mr. RANKIN.]

Prerequisite. Plant Pathology 1.

Designed especially for students in Rural Art.

Advanced and Graduate Courses

14. **Phytopathological Technique.** Throughout the year. Three hours. Lectures, none. Practice (3) by appointment. *Greenhouse.* Professor WHETZEL, Assistant Professor REDDICK, and Messrs. BARRUS, STEWART and WALLACE.

Prerequisites. Must be preceeded or accompanied by Plant Pathology 3.

Laboratory practice in study of the pathogenicity of organisms. Isolation, culture work, inoculation, infection, etc.

[15. **Phytopathological Histology.** Not offered during 1910–11.]

Study of types of histological modifications of plant tissues resulting from disease.

20. **Research.** Throughout the year. Not less than three hours. Professor WHETZEL and Assistant Professor REDDICK.

Original investigation of problems in Plant Pathology.

25. **Seminar.** Throughout the year. One hour. Hour by arrangement. *Agronomy 302.*

Required of all graduate students in this department.

The work of the Plant Pathology Seminar is conducted by the Plant Doctors, a phytopathologist's club which meets for the discussion of current literature and of research.

Plant Physiology

3. **Crop Ecology and Geography.** Second term. Two hours. Lectures (2) W F, 11. *Agronomy 152.* Professor DUGGAR and Mr. MCCOOL.

Prerequisites. All freshman work, or equivalent preparation by arrangement. Recommended for sophomore year or later, and for students with some agricultural experience.

Lectures, demonstrations, and reports emphasizing relations of plants to climate, a study of crops and economic plants with respect to environment and distribution.

[6. **Physiology of the Bacteria.** Not offered during 1910–11.]

7. **General Plant Physiology.** First term. Four hours. Lectures (2) M W, 10. *Main 292.* Laboratory (2) Th, 2–4:30, S, 10:30–1. Mr. KNUDSON and Mr. MCCOOL.

Prerequisites. All freshman work or equivalent. Recommended for sophomore year or later.

Lecture and laboratory work supplemented by field studies where possible. The topics include absorption, nutrition, relations to environmental factors, growth, reproduction, and propagative processes. Limited as to number in 1910 and 1911 unless additional space is provided.

8. **Plant Physiology.** Throughout the year. Four hours. Lectures (2) T Th, 10. *Agronomy 192.* Laboratory (2) W F, 2–4:30. Professor DUGGAR and Mr. KNUDSON.

Prerequisites. Training in Botany and Chemistry. Recommended for the junior year and later. This course, more comprehensive than 7, is recommended in preference to the latter for those specializing in plant work. As far as possible all phases of general and special physiology are treated.

12. **Cytology.** Throughout the year. Three hours. Lectures (1) F, 10. *Agronomy 101.* Laboratory (2) T, 2–5, Th or S, 11–1. *Agronomy 101.* Professor DUGGAR and Mr. ———.

Prerequisite. Adequate training in botany.

A course offered to advanced students, giving instruction in cell physiology, and the physiology of reproduction and inheritance. Microtechnique and special topics.

Primarily for Graduates

15. **The Physiology of Fermentation and Enzyme Action.** Second term. Three hours. Lectures (1) M, 12. *Agronomy 101.* Mr. KNUDSON. Laboratory (2) by appointment.

Prerequisites. Required work through sophomore year. Bacteriology, and Plant Physiology 7 or 8. Recommended for graduates and for undergraduates specializing along physiological, bacteriological, or pathological lines.

16. **General Seminar.** Throughout the year. One hour. Conference (1) F, 11. First term, *Agronomy 152.* Second term, *Agronomy 101.* Professor DUGGAR.

Prerequisites. Limited to advanced students and graduates in the department.

During the first term, topics will be chosen from current work in Plant Physiology. During the second term, special outlines will be followed, also reports on research work presented.

17. **Seminar in Cytology.** Second term. One hour. By appointment. Professor DUGGAR.

18. **Research, General Physiology.** Throughout the year. Credit for major or minor, otherwise no less than four hours. By appointment. *Agronomy 101.* Professor DUGGAR.

Prerequisites. Adequate training in Botany, Chemistry, and Physiology.

19. **Research, Cell Physiology.** Throughout the year. Credit for major or minor, otherwise no less than four hours. By appointment. *Agronomy 101.* Professor DUGGAR.

Prerequisites. Adequate training in Botany and Physiology.

In Plant Physiology 18 and 19, problems in Plant Physiology (including Ecology, Cytology and Heredity) and the general relation of Plant Physiology to agriculture will be assigned for investigation. Reports or theses will be required.

Pomology

1. **Elementary Pomology.** First term. Three hours. Lectures (2) T Th, 11. *Main 292.* Practice (1) Th or F, 2–4:30, or S, 8–10:30. *Main 202.* Professor WILSON and Mr. ANTHONY.

Prerequisites. None.

A study of the methods of propagation and early care of bush and tree fruits; the principles of budding and grafting, with special attention to the particular method of propagation for each kind of fruit.

2. **Practical Pomology.** Second term. Three hours. Lectures (3) M W F, 11. *Main 292.* Professor WILSON.

Prerequisites. A continuation of Pomology 1.

The study and practice of planting, cultivating, fertilizing, spraying and pruning orchards; picking, grading, packing and marketing fruits.

4. **Bush and Small Fruits.** Second term. One hour. Lectures and discussions (1) T, 10. *Main 292.* Professor WILSON and Mr. ANTHONY.

Prerequisites. Pomology 1.

A study of vine and bush fruit culture, including strawberries, covering the picking, grading, packing and marketing of the product.

6. **Spraying of Fruit Trees.** Second term. Two hours. Lectures (1) Th, 10. *Main 292.* Practice (1) Th, 2–4:30. *Main 92.* Professor WILSON and Mr. ANTHONY.

Prerequisites. Pomology 1, Plant Pathology 1, Entomology 8 or 16.

A study of the preparation and application of the different spray mixtures used in orchard practice.

8. **Systematic Pomology.** First term. Two hours. Lectures (1) W, 11. *Main 292.* Practice (1) W, 2–4:30. *Main 202.* Professor WILSON and Mr. ANTHONY.

Prerequisites. Pomology 1 and 2, and Botany 1 and 2 or Biology 1.

A critical examination of the characters and qualities of the fruits of the United States, with reference to botanical relationships, adaptations, and commercial value.

[10. **Advanced Pomology.** First term. One hour. Lectures, problems and discussions (1) F, 9. *Main 202.* Not given in 1910–11. Professor WILSON.]

Prerequisites. Pomology 1 and 2.

Designed especially for students who are planning to do practical and experimental work in pomology. A critical study of the different problems connected with growing, storing, and marketing fruit.

13. **Research in Pomology.** Throughout the year. One or more hours. By appointment. Professor WILSON.

Prerequisites. Pomology 1 and 2. Students taking this course are required to take Pomology 14.

Original investigations of problems in pomology.

14. **Seminar.** Second term. One hour. By appointment. *Main 202.* Professor WILSON and Mr. ANTHONY.

Prerequisites. Open only to graduates and students taking Pomology 13.

Poultry Husbandry

1. **Poultry Husbandry.** Throughout the year. Three hours. Lectures (2) T Th, 9. *Dairy Building 222.* Practice (1) M T or W, 2–4:30. *Poultry Plant or Poultry Laboratory.* Professor RICE, Assistant Professor ROGERS and Mr. SCHWARTZ.

Prerequisites. None.

A general elementary discussion; kinds of poultry farming; poultry farm management; principles of poultry house construction; breeds of domestic poultry; principles of poultry breeding; anatomy of poultry; the killing, picking, grading and packing of poultry; caponizing; poultry diseases and parasites; poultry feeds; feeding for egg production; fattening and rearing; marketing poultry products; judging of dressed poultry and eggs; incubating and brooding.

2. **Feeding and Management.** Second term, after March 1st. One hour. Lectures, none. Practice (1) three short periods each day for four weeks: morning, 8–8:30; noon, 12:45–1.15; and night, 4:30–5. *Poultry Plant.* Professor RICE, Messrs. KRUM and HURD.

Prerequisites. Should be preceded or accompanied by Poultry Husbandry 1. It is well to precede this course by Animal Husbandry 1.

The managing and keeping of records of a flock of fowls for egg production and for fattening, including the care and sale of eggs.

3. **Incubator and Brooder Practice.** Second term after March 1st. One hour. Lectures, none. Practice (1) three short periods per day for four weeks: morning, 8–8:30; noon, 12:45–1·15; and night, 4:30–5. *Poultry Plant.* Professor RICE, Messrs. FINCH and DOUGHERTY.

Prerequisites. Should be preceded or accompanied by Poultry Husbandry 1.

Practice in operating incubators and brooders and in keeping the records for same, including the taking apart and setting up of machines, drawing plans, etc.

4. **Advanced Judging.** First term. Two hours. Recitations (1) Th, 12. *Poultry Laboratory.* Practice (1) Th, 2–4:30. *Poultry Laboratory.* Assistant Professor ROGERS and Mr. KRUM.

Prerequisites. Must be preceded or accompanied by Poultry Husbandry 1.

The origin, history and classification of breeds of domestic poultry. Judging the principal breeds for fancy points, by both score-card and comparison methods.

5. **Poultry Farm Management.** Second term. Two hours. Lectures or recitations (1) Th, 12. *Poultry Laboratory.* Practice (1) Th, 2–4:30. *Poultry Laboratory.* Professor RICE and Mr. ———.

Prerequisites. Poultry Husbandry 1, 2, and 3. It is desirable to precede or accompany this course with Farm Management 1. For advanced and special students.

There will be an excursion to representative poultry plants, about May 11th.

8. **Research.** Either term or throughout the year. One to three hours. By appointment. *Dairy Building 101.* Professor RICE and Assistant Professor ROGERS.

Prerequisites. Poultry Husbandry 1, 2, and 3, and should be accompanied by Poultry Husbandry 9.

The conducting of an original investigation of a problem in Poultry Husbandry. To be presented as a written thesis.

9. **Seminar.** Either term or throughout the year. One to three hours. Recitations (1) by arrangement. *Poultry Laboratory.* Professor RICE and Assistant Professor ROGERS.

Prerequisites. Poultry Husbandry 1, 2, and 3, and should be accompanied by Poultry Husbandry 4 and 5. Can best be taken in the last year for special, and senior year for regular students.

For advanced study and conference. Includes review of literature, written reports on research work and study of advanced problems.

Rural Economy

1. **Agriculture.** First term. Two hours. Lectures (2) T Th, 11. *Agronomy 192.* Professor LAUMAN.

Prerequisites. Open only to freshmen.

A general survey dealing with agriculture in its technical, economic, social and historical aspects. Designed to give the beginner a view of the whole field of agriculture.

4. **Rural Economy.** First term. Three hours. Lectures (3) M W F, 9. *Agronomy 152.* Professor LAUMAN.

Prerequisites. Not open to students below the senior year.

A study of the general economic problems of agriculture.

5. **Rural Social Conditions.** First term. Three hours. Lectures (3) M W F, 11. *Main 193.* Professor LAUMAN.

Prerequisites. Not open to students below the senior year.

A study of the social history, status and problems of the rural community.

6. **History of Agriculture.** Second term. Three hours. Lectures (3) M W F, 9. *Agronomy 152.* Professor LAUMAN.

Prerequisites. Not open to students below the junior year.

The more important phases of the development of agriculture are considered historically.

7. **Conservation.** Second term. Three hours. Lectures (3) M W F, 11. *Main 193.* Professor LAUMAN.

Prerequisites. Open to juniors and seniors in all Colleges of Cornell University.

A general survey of the question of conservation.

14. **Rural Economy. Advanced Course.** Second term. Three hours. Lectures (2) T Th, 9. *Main 193.* Professor LAUMAN.

Prerequisite. Rural Economy 4.

A more detailed and critical study of a few of the general economic problems of agriculture.

15. **Rural Social Conditions. Advanced Course.** Second term. Three hours. Lectures (2) T Th, 11. *Main 193.* Professor LAUMAN.

Prerequisite. Rural Economy 5.

A more detailed and critical study of some rural social conditions.

18. **Investigation.** Either term or throughout the year. *Main 195.* Professor LAUMAN.

Prerequisites. For graduates not candidates for degrees and for advanced seniors by special permission.

19. **Seminar.** Throughout the year. One hour credit for such as desire it. By arrangement. *Main 195.* Professor LAUMAN.

Prerequisites. For graduates, and open to advanced seniors by special permission.

Devoted to current literature, the study of monographs, and reports on the progress of investigation.

Soil Technology

1. **Principles of Soil Management.** Second term. Three hours. Lectures (2) M W, 10. *Main 292.* Practice (1) M W Th or F, 2–4:30. *Agronomy 42.* Professor FIPPIN and Mr. BUCKMAN.

Prerequisites. Chemistry 85 and Geology 1 first term. Should be taken in sophomore year.

An elementary course covering the derivation, classification, function, and properties of soils, and the principles of their management in plant production.

2. **Principles of Soil Management.** First term. Three hours. Lectures (2) M W, 10. *Agronomy 152.* Practice (1) M W Th or F, 2–4:30. *Agronomy 42.* Professor FIPPIN and Mr. BUCKMAN.

Prerequisites. Chemistry 91, which may be taken at the same time. Designed for special students. Should be taken the first year. Similar to Soils 1.

4. **Soils of the United States.** Second term. Three hours. Lectures (2) T Th, 10. *Agronomy 152.* Excursions (1) F, 2–4:30. Professor FIPPIN.

Prerequisites. Soils 1 or 2. For juniors or seniors.

A discussion of the classification and occurrence of soils in the United States and especially in New York, with particular reference to their distribution, crop relations, agricultural importance, and special features in their management. Designed to give a comprehensive view of the soil resources of the country. Illustrated by maps and slides. Excursions and field trips will cost not to exceed five dollars.

5. **Soil Surveying.** First term. Two hours. Leetures, none. Practice (2) S, 8–1. *Field and Agronomy 42.* Professor FIPPIN.

Prerequisites. Soils 1 or 2. Farm Management 1 is a desirable preparation. For juniors or seniors.

Preparation of reports and maps on soil conditions, classification, and agricultural development of specific areas, with particular reference to farm management. Study of the business development of land. First half of term devoted to field studies and last half to laboratory studies and preparation of reports.

6. **Advanced Soils.** First term. Two hours. Lectures (2) T Th, 9. *Agronomy 152.* Professor FIPPIN.

Prerequisites. Soils 1. For juniors or seniors.

Discussion of physical, chemical and biological properties of the soil as they bear on crop production, mechanical analysis, physics of the retention and movement of moisture and air, absorption of heat, chemistry of the soil solution, alkali and its amelioration and the biological relations of the soil as they affect fertility.

7. **Manures and Fertilizers.** First term. One hour. Lectures (1) Th, 11. *Agronomy 152.* Professor FIPPIN and Mr. HARRIS.

Prerequisites. Soils 1 or 2.

This course deals with the kinds, quality, composition, deterioration and economic use of manures; the sources, function, composition, and use of commercial fertilizers, and the kinds, use and efficiency of soil amendments.

8. **Drainage and Irrigation.** Second term. Two hours. Lectures (1) F, 9. *Agronomy 152.* Practice (1) T, 2–4:30. *Agronomy 42.* Professor FIPPIN and Mr. PHILLIPS.

Prerequisites. Soils 1. Farm Engineering 20 is also desirable. For juniors and seniors.

History, economic relations, principles and practice of drainage and irrigation.

10. **Advanced Laboratory.** Either term. One or more hours. Practice by arrangement. *Agronomy 42.* Professor FIPPIN and Mr. BUCKMAN.

Prerequisites. Must be preceded or accompanied by Soils 6. Should be accompanied by Soils 14.

A series of experiments illustrating the physical and chemical properties of soil in their relation to moisture, fertilizers and plant production.

11. **Research in Soils.** Either term. One or more hours. Lectures, none. Practice by appointment. *Agronomy 211.* Professor LYON and Assistant Professor BIZZELL.

Prerequisites. Admission by conference. For graduate students only.

One or two students who are qualified to conduct research in certain phases of soil investigation may register for a major subject in the soils research laboratory.

14. **Soil Seminar.** Throughout the year. One hour. M, 7–8:30 P. M. *Agronomy 202.* Professors LYON and FIPPIN, Assistant Professor BIZZELL.

Prerequisites. Required of students taking Soils 10, 11, or thesis work, and of all graduate students in soils.

Review of current literature, preparation of special reports, and the discussion of current problems in soil management.

Rural Art

Not Open to Special Students

This is a four-year course, the first two years of which include the regular work of the College of Agriculture, with the junior and senior years specialized along lines pursuant to rural art and landscape architecture. This course prepares the student better to understand the value of rural and civic improvement problems, and, supplemented by one year or more of office training with a reputable landscape architect, fits the student to enter the more professional field of landscape art.

Courses, 1, 2, 3, and 4 of this department are in a sense broadly educational and are open to the general student. Course 1 is particularly for the benefit of the winter-course students. Course 6 may be taken by students not specializing in Rural Art.

Previous to entering upon the more specialized work of this department, beginning in the junior year, the student must have completed the requirements of the freshman and sophomore years and in addition must offer the following: Trigonometry 7b (prerequisite to Elementary Surveying 10, which may be taken in junior year preparatory to Rural Art 9); Elementary Architecture 11; Rural Art 3.

Previous to graduation the student should have completed the following courses in addition to the regular work: Economic Entomology 8, Rural Economy 4, Greenhouse Construction 19, Water Color 14, Perspective.

Graduate work is offered in this department.

Below is given a suggested outline of the Rural Art course for students to follow:

First year.	First term	Second term
English 1	4	4
Botany 1	3	1
Botany 2	–	2
Chemistry 1	6	–
Chemistry 85	–	4
Biology	3	3
Drawing 2	2	2
Rural Art 2	–	1
	18	17

Second year.	First term	Second term
Geology 1	3	3
Physics 1	4	–
Physics 5	2	–
Physics 10	2	–
Physiology of Domestic Animals 21	–	3
Trigonometry 7b	–	2

Second year.	First term	Second term
Elementary Architecture 11	3	3
Perspective	–	1
Shades and Shadows 13	1	–
Water color 14	–	2
Rural Art 3	1	1
	16	15

Third Year.	First term	Second term
Rural Art 4	2	1
Rural Art 5	3	3
Rural Art 6	2	2
Rural Art 7	2	2
Entomology 3	3	–
Economic Entomology 8	–	2
Political Science 51	3	3
Elementary Surveying 10	3	–
	18	13

Fourth Year.	First term	Second term
Rural Art 8	3	3
Rural Art 9	2	2
Rural Art 10	2	2
Rural Art 11	–	1
Horticulture 19	2	–
Soils 1	–	3
Rural Economy 4	3	–
	12	11

Suggested Choice of Electives

Plant Pathology 1 and 2	3	3
Horticulture 32	2	2
History of Architecture 10	3	3
Planning of Domestic Buildings 34. 5 lectures, no credit.		
Modern Architecture 40	–	2
Pen and Ink Drawing 37	2	–
Life Class 42	2	2
Thesis	2	2

1. **Rural Improvement.** A course of six lectures, beginning after the Christmas recess. No University credit. By appointment. *Agronomy 152.* Mr. ———.

Prerequisites. None. Open to regular, special and winter-course students.

This course deals with questions of rural improvement such as will enable the young man or woman from the farm to get a point of view in rural art in general, together with specific hints for working out some of his home problems.

2. **Lectures Introductory to Work in Rural Art.** Second term. One hour. Lectures (1) T, 12. Mr. ——, and occasional lectures by Assistant Professor FLEMING and other practicing landscape architects.

Prerequisites. None. Intended for freshmen or sophomores.

3. **History of Landscape Design.** Throughout the year. One hour. Lectures (1) T, 10. *White Hall.* Mr. ———.

Prerequisites. None. Required for Rural Art 4.

A study of the chronological development of the art of landscape gardening, its modifications in various countries, and the influences which have affected its development. A full study of the three types of gardening, ancient, mediæval and modern, and their relation to landscape work of the present day.

4. **Theory and Aesthetics of Rural Art and Landscape Design.** Throughout the year. Two hours. Lectures (2) T. 11, W, 9. Assistant Professor FLEMING and staff of visiting lecturers.

Prerequisites. After 1911, Rural Art 3. Intended for juniors or seniors. Students specializing in Rural Art must take this subject in the junior year.

A study of the principles of landscape design, and discussions on theory in application to specific problems. Assistant Professor Fleming will be assisted by representative farm superintendents, nurserymen, park superintendents, gardeners, garden architects, civic advisers and landscape architects. Subjects in general to be covered as follows: ideals of landscape design; the appreciation of our landscape; the personal equation in landscape design; principles, elements and materials of landscape design; landscape improvement of farm properties; private properties; country estates; home grounds; gardens; public properties; civic design; park design; park planting; park maintenance.

5. **Landscape Design.** Elementary course. Throughout the year. Three hours. Drafting periods (3) M W F, 2–4:30. *White Hall.* Mr. ———

Prerequisites. Requirements of the freshmen and sophomore years.

Work upon practical local and office problems in design, finished plans and detailed working drawings, with specifications. The aim is to familiarize the student with the various types of plans as applied to different problems, and a series of competitive problems, sketch, preliminary, and final, continues throughout the year. These will be judged by a competent committee.

6. **Organography of Plant Materials of Landscape Gardening.** Throughout the year. Two hours. Lectures (1) Th, 12. Practice (1) F, 10–12:30. Mr. ———.

Prerequisites. None.

A comprehensive study of the ready identification at all seasons of trees, shrubs, vines and perennials (native and introduced) which are used by the landscape gardener. This is not a course of a distinctly horticultural nature but is for the purpose of familiarizing the student in landscape design with

the planting material used in general landscape work. Special attention is given to the general characteristics of such material, considered as elements of outdoor art composition.

7. **Freehand Sketching.** Throughout the year. Two hours. By arrangement. *Dairy Building 341.* Assistant Professor BAKER.

Prerequisites. Drawing 1.

Sketching and rendering in various media of indoor and outdoor subjects particularly pertaining to landscape design.

8. **Advanced Problems and Research in Landscape Design.** Throughout the year. Three hours, and by special arrangement additional hours. Drafting periods M W F, 2–4:30. *White Hall.* Assistant Professor FLEMING and others.

Prerequisites. Rural Art 5.

The more complicated problems, such as country estates, parkways and civic centers, are taken up and worked out in detail. Studies, reports, plans of arrangement, rendered studies, detailed drawings, grade designs, planting plans, total estimates of cost, and a set of specifications are worked out for two major problems. Minor problems and sketch problems are required from time to time.

9. **Landscape Engineering and Details of Construction.** Throughout the year. Two hours. Lectures (1) T, 9. Practice (1) F, 10–12:30. Mr. ———.

Prerequisites. Elementary Surveying 10. Intended for seniors.

The engineering work peculiarly necessary to landscape gardening, such as the making of relief maps, contour maps, setting of grade stakes, slope stakes, making profiles, sections and finished grade designs, use of plane-table, estimates of cost of construction.

10. **Plant Materials of Landscape Gardening.** Advanced course. Throughout the year. Two hours. Lectures (1) W, 10. Practice (1) T, 2–4:30. Assistant Professor FLEMING and others.

Prerequisites. Rural Art 6. Intended for seniors.

A detailed study of the use, adaptation and arrangement of ornamental trees, shrubs, vines and perennials in all the phases of landscape gardening; composition of this material from an æsthetic standpoint; planting problems of the landscape architect, park commissioner and landscape gardener; planting plans, nursery lists and estimates of cost of plantings.

11. **Seminar.** Second term. One hour. Hours to be arranged. Assistant Professor FLEMING and others.

A review of current literature and the discussion of important questions relating to various phases of landscape work, and reports on investigations.

Excursions. During or at the end of the second term, a four to five day trip is generally taken for the purpose of studying a variety of good examples of landscape work.

1909 and 1911—Albany to New York, Hudson River Section.

1910 and 1912—Vicinity of Philadelphia and Washington.

Normal Department—Nature-Study

Two-year Special Course in Nature-Study

This course is designed to help persons who expect to teach nature-study and country-life subjects in the public schools. Persons actually engaged in teaching and also all persons in the University who signify their intention to teach are eligible. A certificate will be given on the completion of 60 hours in the courses prescribed below, together with such other work in the College of Agriculture as may be approved by the Secretary.

It should be understood that the outlined two-year course does not undertake to furnish the training necessary to fit for teaching positions in the better high schools. Students intending to prepare for such work are advised to complete the regular course leading to a degree, electing the special course of this department.

First Year.	No. of course	First term	Second term
Botany	1	3	1
Botany	2	—	2
Biology	1	3	3
Entomology	3	3	—
Geology	1	3	3
Chemistry	91	3	—
Nature-Study	1	—	2
Horticulture	32	2	2
		17	13
Elective, two-thirds agriculture		0–1	2–5

Second Year*.	No. of course	First term	Second term
Vertebrate Zoology	5	3	3
Botany	5	—	2
Soils	2	3	—
Farm Crops	3	4	—
Nature-Study	6	1	—
Nature-Study	2	2	2
		13	7
Elective, two-thirds agriculture		2–5	8–11

*Additional courses in education may be required during the second year.

Courses in Nature-Study

1. **Nature-Study Pedagogy.** Second term. Two hours. Lectures (2) T Th, 12. *Goldwin Smith 227.* Mrs. Comstock.

Prerequisites. None.

Lectures on nature-study as a part of primary education and a discussion of methods of correlating nature-study with other school work; a review of nature literature.

2. **Nature-Study Field and Laboratory Work.** Throughout the year. Two hours or more. Lectures, none. Practice (2) T Th, 8–10. *Insectary.* Mrs. COMSTOCK.

Prerequisites. Biology 1 and Botany 1 and 2.

This course gives laboratory and field practice with those subjects in plant and animal life which are best fitted for nature-study in the elementary schools. Special attention is given to methods of study and manner of presentation, and also to the relating of the topics to agriculture. The work consists of conferences, field and laboratory practice.

3. **Nature-Study of the Garden.** First half of first term; second half of second term. One hour. Practice by arrangement. Mrs. COMSTOCK.

Prerequisites. This should be preceded by Botany 1 and 2 and Biology 1 or its equivalent.

This course is for teachers or others interested in gardening. It has for its object interesting the child in all the life of the garden, and deals with the life histories of the common flowers and vegetables as well as the weeds. It includes nature-study lessons on the birds and insects, beneficial or harmful, affecting the garden. This course can be given only during the time that the gardens are available, and is to supplement the course in school-gardening.

4. **The Nature-Study of the Farm.** First term. Two hours. Lectures (2) T Th, 12. *Main 392.* Mrs. COMSTOCK.

Prerequisites. None.

This deals, from the nature-study standpoint, with the common birds, animals, insects, trees, plants and weeds found most commonly on the farm and of special interest to the farmer. Discussion of popular nature literature. This is especially planned for students from the farm and those interested in introducing nature-study into the rural schools.

6. **School Gardening.** First term. One hour. Lectures and practice (1) T, 2. *Main 191.* ALICE G. MCCLOSKEY.

Prerequisites. Open to students who have had Horticulture 32.

Lectures on gardening as related to primary education; management of school gardens; discussions relating to school gardens.

FORESTRY

A Department of Forestry has been established and instruction in the subject may be expected in 1911–12.

SPECIAL WORK

Opportunities are provided for persons who desire to pursue special work. Students must be at least eighteen years of age to take advantage of this work, and applications will be received until September 15. No non-resident of the State of New York will be accepted under the age of twenty-three, unless he can meet all requirements for entering upon the regular course.

1. **Special Work in General Agriculture.** This work is designed to meet the needs of young men and young women from the farm who have not the

time to give to a four years' course. They must satisfy the College that they are well enough grounded in the secondary school subjects to enable them to pursue the work with credit to themselves and with honor to the University, and also that they desire to take the work because of direct interest in agricultural affairs. They must present an honorable dismissal from the school last attended and certificates of good moral character, and will be required to present such other certificates and letters as may be desired. This work is not a definite "course" in the sense of having a program or a prescribed set of studies. The student chooses any of the agricultural "electives" that he may be able to pursue. Certain courses are to be given by some of the departments for those who lack some of the fundamental work usually required in those subjects. Admission as a special student does not admit to classes. The student is admitted to the various classes by the heads of the departments concerned.

2. **Nature-Study Special Course.** This course of two years is open to teachers, or to such students in regular University courses as signify their intention to teach, who desire to prepare themselves in nature-study and country-life subjects. In this course the work is largely prescribed. The course comprises two categories of work: the subject-matter studies, and the pedagogical work. The subject-matter is secured in the regular classes of the University, largely in the biological departments. The pedagogical training is to be had in connection with the regular nature-study courses.

EXTENSION WORK

The extension work of the College of Agriculture is designed to help persons directly on their farms, and to aid those who desire definite instruction, but cannot take a long or regular course in agriculture in the University. It supplements the teaching and experimenting of the College of Agriculture. It is professedly a popular work. It endeavors to reach the common problems of the people, to quicken the agricultural occupations, and to inspire a greater interest in country life. It is also a bureau of publicity, whereby there is an exchange of all important matters connected with the progress of the agriculture of the State.

Winter-Courses

The Winter-Courses now offered are five, all opening Nov. 29, 1910, and closing Feb. 24, 1911. They are:

1. General Agriculture.
2. Dairy Industry.
3. Poultry Husbandry.
4. Horticulture.
5. Home Economics.

A special program describing these courses will be sent on application to the Secretary, New York State College of Agriculture, Ithaca, N. Y.

OFFICIAL PUBLICATIONS OF CORNELL UNIVERSITY

Issued at Ithaca, N. Y., monthly from July to November inclusive, and semi-monthly from December to June inclusive.

[Entered as second class matter, August 31, 1910, at the post office at Ithaca, N. Y., under the Act of July 16, 1894.]

These publications include the annual Register, for which a charge of twenty-five cents a copy is made, and the following publications, any of which will be sent gratis and post-free on request:

General Circular of Information for prospective students,
Announcement of the College of Arts and Sciences,
Courses of Instruction in the College of Arts and Sciences,
Announcement of Sibley College of Mechanical Engineering and the Mechanic Arts,
Announcement of the College of Civil Engineering,
Announcement of the College of Law,
Announcement of the College of Architecture,
Announcement of the Medical College,
Announcement of the New York State College of Agriculture,
Announcement of the Winter Courses in the College of Agriculture,
Announcement of the New York State Veterinary College,
Announcement of the Graduate School,
Announcement of the Summer Session,
Annual Reports of the President and the Treasurer,
Pamphlets on scholarships, fellowships, and prizes, samples of entrance and scholarship examination papers, special departmental announcements, etc.

Correspondence concerning the publications of the University should be addressed to

The Registrar of Cornell University,
Ithaca, N. Y.